Sr. Gouv. Regist. 180[illegible]

AN

ESSAY

ON

DISEASES

INCIDENTAL TO

EUROPEANS IN HOT CLIMATES.

WITH THE

Method of preventing their fatal Consequences.

By JAMES LIND, M.D. F.R.S. Ed.

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and of the Royal Colleges of Physicians at Edinburgh
and Copenhagen;
Late Physician to the Royal Hospital at Haslar,
near Portsmouth.

To which is added,

AN APPENDIX CONCERNING INTERMITTENT FEVERS.

AND

A simple and easy Way to render Sea Water fresh, and
to prevent a Scarcity of Provisions in long
Voyages at Sea.

THE FIFTH EDITION.

Ars quæ sanitati tuendæ præsidet, iis qui sibi paruerint constantem sanitatem promittit. GALEN.

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TO

PHILIP STEPHENS, Efq.

SECRETARY to the ADMIRALTY.

SIR,

MY former attempts in the literary way having been honoured with your approbation and protection, I prefume to prefix your name to this work; not only as an ornament to my labour, but as a fmall inftance of gratitude for the friendfhip with which you have diftinguifhed,

SIR,

Your moft obliged, and

moft obedient fervant,

JAMES LIND.

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INTRODUCTION.

THE following ſheets are preſented to the public, as a ſequel to what I have already publiſhed on the moſt effectual Means of preſerving the lives of Seamen, and ſuch as undertake Voyages to diſtant Countries; or rather as a Concluſion of all the conſiderations, which I formerly offered on that moſt important, and moſt intereſting ſubject.

In that Eſſay, my attention was principally directed to the preſervation of people crowded together within the narrow limits of a Ship, whether ſeamen, ſoldiers, or paſſengers.

After having ſuppoſed that theſe are ſafely landed, the following precepts, in addition to thoſe I have already given, become highly neceſſary to preſerve unimpaired their health and conſtitutions during their reſidence in a foreign climate.

Thouſands leave England every year to go to the Eaſt and Weſt-Indies, or with the deſign of ſettling in ſome of our American Colonies. Many have lately gone to people

those parts of America and the West India Islands, which were ceded to us by the last treaty of peace. Regiments are often sent out from England, to relieve others stationed in the most distant parts of the Globe; and recruits for those regiments are still more frequently ordered abroad. This Essay is designed for the benefit of these several classes of British Emigrants.

Men who thus exchange their native for a distant Climate, may be considered as affected in a manner somewhat analogous to plants removed into a foreign soil; where the utmost care and attention are required, to keep them in health, and to inure them to their new situation; since, thus transplanted, some change must happen in the constitutions of both.

Some Climates are healthy and favourable to European constitutions, as some Soils are favourable to the production of European plants. But most of the Countries beyond the limits of Europe, which are frequented by Europeans, unfortunately prove very unhealthy to them. To ascertain the comparative degrees of Health which Europeans enjoy in such Countries, to point out the most

most effectual Means of obviating the malignant Effects of the Climate, and to give the proper Treatment of the Diseases, to which in each, they are most exposed, constitute the Subject of the following Treatise.

It is a Subject of high importance: let us consider the unhappy fate of the first adventurers and discoverers of the southern parts of Africa, the Portuguese, who, in the 15th and 16th centuries, spread their settlements over the coast of Guinea, and a great part of India. They suffered more by sickness, than by shipwreck, though on an unknown coast, and even more by it than they did, by their wars with the natives, and every other accident. In many places on the coast of Guinea, where they were formerly settled, we can now hardly trace any vestige of their posterity, but such as are of the Mulatto breed. A corruption of their language, under the name of Lingua Franca, is the only memorial that they have left behind them.

Those first adventurers, into the southern climates, seem to have had no knowledge of the true cause of their Sickness. They observed,

ferven, that ſuch as had the good fortune to eſcape a fit of ſickneſs, or death, ſoon after their arrival, enjoyed afterwards a pretty good ſtate of health; and thence they concluded, that the Blood of ſuch perſons had been entirely changed, by the diet of the country. Upon this erroneous principle, they adopted a moſt fatal method of ſeaſoning people, to theſe unhealthy climates.

They, by ſmall quantities, frequently repeated, took away as much Blood, as they ſuppoſed to be contained in the body, and thus reduced the patient, to a ſtate of extreme weakneſs: Suppoſing that this loſs was immediately ſupplied, by the food and water of the country, and that their Blood was thereby compoſed of the ſame materials with that of the natives, they flattered themſelves, that they ſhould afterwards poſſeſs Conſtitutions equally calculated, to bear the inconveniences of the climate.

Their abſolute ignorance of the true cauſes of ſickneſs in thoſe climates, appears likewiſe from the bad Situation of the places, upon which they pitched for their Settlements.

Thus,

Thus, on the firſt diſcovery of the Cape de Verd Iſlands, the Portugueſe propoſed that the Capital of all their dominions, in the northern parts of Guinea, ſhould be placed in one of thoſe iſlands. For this purpoſe, they fixed upon Saint Jago, the moſt unhealthy of them all, and, as has ſince clearly appeared, they founded their capital, upon even the moſt unhealthy ſpot of that iſland. Then, as if the natural evils of the ſituation and climate had not been ſufficient, they added to them, by having wet ditches in their neighbourhood, the waters of which were perpetually ſtagnant. The great deſtruction, which has befallen the Portugueſe at that place, affords a moſt ſtriking and melancholy proof of their error.

Several erroneous opinions have been entertained, concerning the cauſes of Sickneſs in unhealthy climates. It has been a very general opinion, that the vegetable productions of unhealthful climates, are the cauſe of ſickneſs in them to ſtrangers: I have in another work obſerved *, that when Prince

 Eugene

* In my Eſſay on preſerving Seamen, p. 61. It is here neceſſary to obſerve in general, that the Pages of my

Eugene commanded in Hungary, in order to avoid the ſickneſs of that country, all the proviſions for his table were ſent him from Germany. But the vegetable productions cannot be the cauſes of ſickneſs in ſuch climates, for two reaſons: becauſe rice, millet, Indian corn, and other productions of the moſt unhealthy countries, are eat ſafely, when brought from thence to other places: and in ſuch unhealthy ſituations the uſe, even of the European productions for diet does not preſerve from ſickneſs.

Further, the drinking of bad Water has been highly blamed. Unwholeſome water will certainly produce fluxes, and ſome other diſeaſes. But whenever this is the ſole cauſe, the diſeaſes will be uniform, at all ſeaſons of the year, and the uſe of good water will effectually prevent them: neither of which, upon experience, we find to be the caſe, in the countries of which we treat.

Laſtly, the Irregularities of many young and thoughtleſs people who go the Eaſt

my other Works, occaſionally quoted in this, refer to the laſt editions of them, viz. to the third Edition of my Treatiſe on the Scurvy, the third of my Eſſay on preſerving Seamen, and the ſecond of my Diſſertation on Fevers and Infection.

or

or West Indies, have been assigned as the principal causes of their sickness and death; thus it is often said, that they fall a sacrifice, not to the air of the country, but to their own debauchery. For if those who are newly arrived at Jamaica, drink immoderately of new rum, they will fall into a violent fever: if they commit any excess in eating fruits, they will have a flux: or if they load their stomach with indigestible food, they will have a cholera morbus, or a vomiting, which may carry them off in a few hours. But it is equally certain, that the most abstemious and temperate persons often die soon, in unhealthy countries, as well as the irregular and debauched. Upon the whole, violent exercises, excessive drinking, and every species of intemperance, dispose the constitution, to the attack of the epidemic diseases of hot Climates: but they are no other than pre-disposing causes; the causa proxima, or the immediate cause of the epidemic diseases, in those countries, being very different.

The recent examples of the great mortality in hot climates, ought to draw the attention of all the commercial nations of Eu-

rope, towards the important object of preserving the health of their countrymen, whose business carries them beyond seas. Unhealthy settlements require a constant supply of people, and of course drain their mother-country of an incredible number, and some of those its most useful inhabitants. Of this the Spanish dominions abroad have furnished us with striking proofs: even at this day, many of the Spanish merchants and adventurers, who yearly take their departure from Europe, die at Porto-bello or Carthagena, soon after their landing.

The Dutch settlements at Surinam, St. Eustatia, and Curacoa, as well as several in the East-Indies, have proved fatal in point of health to the Dutch; as have the islands of Martinico, St. Domingo, and lately the country of Guiana, to the French settlers.

Great Britain itself has its *Jamaica*; where the number of English sacrificed to the climate is hardly credible, and only to be guessed at from the common computation, that this island formerly buried to the amount of the whole number of its white inha-

inhabitants once in five years; however it has of late become more healthy.

It is now a well known and certain truth, that of such Europeans, as have fallen victims to the intemperature of foreign climates, nineteen in twenty have been cut off by fevers and fluxes: these being the prevailing and fatal diseases in unhealthy countries through all parts of the world.

In my *Essay on preserving Seamen*, I have said, that a malignant fever of the remitting or intermitting kind, most frequently a double tertian, is the genuine produce of heat and moisture, is the autumnal fever of all hot countries, and is the epidemic disease between the tropics. To which I may add, that it is also the disease most fatal to Europeans, in all hot and unhealthy climates.

Of this sickness I shall attempt to give a clear and distinct view, together with its various symptoms and appearances, in most parts of the known world; and the influence of the climates, seasons, and various other incidents upon it; in order to ascertain the most effectual methods of preventing its attack *.

Though

* It will be necessary, for the sake of perspicuity, to give

Though a fever is so frequent and common a disease, yet there is, perhaps, no one so difficult to characterize and define by infallible criteria.

An

give an explanation of the appellations, by which the different fevers, we shall have occasion to mention, have been distinguished, and in what sense they are here to be understood.

The ancient Greek and Roman Physicians denominated it an Ephemera, or Day fever, when a fever, proceeded from violent exercise, drunkenness, or the like causes; and after continuing only twenty-four hours, unattended with any bad symptoms, left the patient, in as perfect health as before its attack. If it continued longer than twenty four hours, without an intermission, and unaccompanied with violent or dangerous symptoms, they called it a mild, continual fever; or a Synochus non putris: the most simple idea we can conceive of this fever, is an increased velocity of the circulation of the blood, without any remarkable diseased condition of the fluids, or of the solids of the body.

They, on the other hand, termed the fever Synochus putris, or a continual putrid fever, when the blood, or other humours of the body, were found to be in a morbid state, and the bowels perhaps affected; the symptoms being then likewise more violent or dangerous. Those appearances, or symptoms, might either shew themselves, upon the patient's being first attacked, when the fever was then known to be putrid; or they might appear after a Synochus non putris had continued for

some

An encreased velocity of the circulating blood has been supposed to constitute the very essence of a fever: but in some fevers, of

some days, when it was then said to have changed its nature, and to have become a Synochus putris.

Besides these, the ancients assigned various other names to fevers, according to their different symptoms. The CAUSUS, or ardent fever, was so denominated, from a violent scorching heat of the body, accompanied with intolerable thirst, dryness of the skin, mouth, tongue, &c. This ardent fever being most acute in its nature, often destroyed the patient on the third or fourth day from its attack, and (if the true causus) seldom continued longer than the seventh day. It may be here proper to observe, that the ancients do not seem to have understood by the term putrid, when applied to a fever, that kind of putrefaction, which a dead body naturally undergoes. I am inclined to believe, that they derived the appellation, and their theory of the putrid fever, from the philosophy of Aristotle, who in one of his problems asserts, "Omnia quæ putrescunt calidiora fiunt." And hence the distinguishing characteristic of the putrid fever was, a sensation remarkably pungent and disagreeable, on touching the patient's skin.

Some modern writers have endeavoured, to class continual fevers under the three denominations of the inflammatory, the slow or nervous, and the putrid or malignant.

The first may be supposed to attend all inflammations, particularly of the membranes of the body; and

to

of which we ſhall have occaſon to treat, the pulſe gives no certain criterion of its nature, nor any indication of danger in the diſeaſe.

to have for its inſeparable ſymptoms, a ful' quick, and ſometimes an hard or oppreſſed pulſe.

In the nervous fever the pulſe is ſuppoſed to be much lower, and not ſo full, or hard; and while it is accompanied with but few ſymptoms of a violent inflammation, the nerves and brain ſeem principally affected.

As to the putrid or malignant fever, I have already ſhewn, whence the epithet of putrid came firſt to be aſſigned to fevers: it is often uſed to characterize a low fever, attended with very dangerous ſymptoms, and in contradiſtinction to the inflammatory fever.

A malignant fever is ſometimes underſtood to denote a fever produced from a violent contagion; but more properly a fever accompanied with uncommon, violent, and dangerous ſymptoms. In like manner, when the ſmall-pox has only its proper and favourable ſymptoms, we call it a mild ſmall-pox; and on the contrary, when accompanied with purple ſpots, bloody urine, delirium, &c. we ſay it is a malignant ſmall-pox. A diſeaſe or fever is alſo ſaid to be malignant, when it makes its firſt attack with violent and dangerous or mortal ſymptoms; in which ſenſe, that epithet is often uſed in the following ſheets.

Fevers are with more propriety claſſed into intermitting, remitting, and continual. An intermitting fever leaves the patient free from all ſymptoms of the fever during its abſence or intermiſſion. A remitting fever has irregular or imperfect intermiſſions. A continual fever has not any perceptible intermiſſion. Each

disease. In my opinion, a fever can no otherwise be defined, than as an indisposition of the body, attended commonly with

Each of these fevers, whether intermitting, remitting, or continual, may be either attended with the usual and gentle symptoms, or they may be accompanied with violent, dangerous, and fatal symptoms, and hence be denominated malignant.

Again, in all those three kinds, if the bile, either pure or mixed, be copiously or frequently evacuated, by vomit or stool, the fever is said to be bilious; and there is sometimes a pain, attendant on that evacuation, felt on the seat of the liver.

A yellow colour of the skin is observed, not only in common intermittents, but frequently also in other fevers; sometimes denoting, as in contagious fevers, their malignant nature; at other times, as in some West-Indian fevers, an universal dissolution of the blood and humours; and frequently accompanying gentle discharges of bile and a diseased liver.

Intermitting fevers are called quotidian, or tertian, according as they renew their attack every day, or every other day; and the term double tertian, as made use of in the general sense of these sheets, signifies, that the patient has two fits, one commonly slighter, the other more severe, in the space of forty-eight hours.

I am sensible these definitions are liable to objections, but they will explain the terms used in this publication in the sense I wish them to be understood. The term Epidemic signifies the universality of a disease: Endemic its constancy in a particular place: and Sporadic, its less frequent appearance.

an increaſe of heat; a thirſt; often with a head-ach; more frequently with a remarkable quickneſs of the pulſe, or at leaſt a great change from its natural ſtate; and, for the moſt part, with various other ſymptoms of diſtreſs; which, in a few days, terminate in a recovery, a remiſſion, or death.

Theſe things being explained, we have nothing farther to premiſe, but a ſuggeſtion of our fears—That an inexperience of foreign countries, and an ignorance of the true cauſes of ſickneſs in them, prove as fatal to Europeans, as the malignant diſpoſition of the moſt unwholeſome climate.

ADVICE
TO
EUROPEANS.

PART. I.

The Seaſons of Sickneſs and the Diſeaſes incidental to ſtrangers in different parts of the world.

CHAP. I.

The Seaſons of Sickneſs and the Diſeaſes in Europe and North America.

SECT. I.

Unwholeſome ſeaſon in England and the diſeaſes produced by it: in the Netherlands, Hungary, Campania of Rome, the Iſlands of Sardinia and Minorca, Gibraltar.

WE ſhall now enter on a ſurvey of the various regions of the Globe, and of the diſeaſes peculiar to them; and ſhall begin our obſervations with the effects of heat and moiſture in England.

The

The years 1765 and 1766 were distinguished by an uncommon appearance of intermitting and remitting fevers, in most parts of England. One obvious cause of them was the unusual frequency of an unwholesome easterly wind.

An east wind in England is often accompanied with a fog which it is said to bring with it from the sea: but the truth of the matter is, that this wind then raises a copious vapour from water, mud, and all marshy or damp places.

I do not remember to have met with any observations made on this exhaling quality of the easterly wind: though I have been an eye-witness of it. When the wind changes to the east, the mud sometimes sends up a vapour as thick as smoke. Two fish ponds in my neighbourhood, one of fresh, the other of salt-water, upon the approach of an easterly wind, sometimes also emit a dense vapour, as from a pot of boiling water.

In order to view this phænomenon distinctly, the person should stand at about 100 yards distant from the ponds. If the sun shines, when the wind changes to the east, he will observe a constant stream of vapours rising

rising out of the ponds, from about five to ten yards height, while the air about him remains serene. As the vapour or fog arising from other places glides along the surface of the earth, and is brought by the easterly wind to the ponds, he will still be able, for some time, to distinguish the vapours ascending perpendicularly out of the ponds, from those which are carried in an horizontal direction by the wind; especially if the sun continues to shine, though faintly.

This evaporating quality of an east wind, seems to manifest itself also by its effects, both on the thermometer, and the human body. A thermometer, hung over a damp piece of ground, during the fogs or exhalations arising from it, will often indicate a degree of cold below the freezing point. There is also a chillness of the body, sensibly perceived in this situation, nearly the same as that arising from the wet floor of a chamber.

But winds are not constant in their effects: as we have sometimes warm weather with a north wind, and sometimes very little heat with a wind from the south; so the fogs attending an east wind are not constant;

neither is the evaporation which we have mentioned at all times to be perceived.

I am perfectly ſenſible, that there may be a deception in theſe matters, and that, inſtead of ſuppoſing the quantity of vapours exhaled to be increaſed by an eaſterly wind, the coldneſs of that wind may be ſuppoſed only to condenſe and render viſible the vapours in the air at that time. But even this ſuppoſition is liable to great objections, as our coldeſt north winds ſeldom or never produce ſuch an effect, but are commonly attended by ſerene dry weather.

Let that be as it will, an eaſt wind is uſually accompanied by a cold, damp, and unwholeſome vapour, which is obſerved to affect both animal and vegetable health, and in many places to give riſe and obſtinacy to intermitting fevers, as alſo to produce frequent relapſes.

In particular ſpots of the low damp iſland of Portſea, the ague frequently prevails, and ſometimes the flux, during the autumnal ſeaſon; in ſome years they are much more frequent and violent than in others. It is obſervable, that their attack proves always moſt ſevere to ſtrangers, or thoſe who have

formerly lived on a drier ſoil, and on a more elevated ſituation.

The year 1765 was remarkable, not only for the long continuance of eaſterly winds, but alſo for an exceſſive degree of heat, which produced a more violent and general rage of thoſe diſeaſes, than had been known for many years. During the months of May, June, and July, we had ſeldom fewer at Haſlar-hoſpital than thirty or forty patients, labouring under regular Tertian agues, with perfect intermiſſions. Of theſe, ſome were ſeized on board the guard-ſhips that lay in the harbour near the mud, but the greateſt number were marines, who did duty at Portſmouth.

In the month of Auguſt the quickſilver, in Farenheit's thermometer, often roſe to eighty-two degrees in the middle of the day. This heat, together with the want of refreſhing rains, ſpread the fever, increaſed its violence, and in many places changed its form. At Portſmouth, and throughout almoſt the whole iſland of Portſea, an alarming continual, or remitting fever, raged, which extended itſelf, even as far as Chicheſter. At the ſame time the town of

 Goſport,

Gosport, on the opposite side of the harbour, though distant only one mile from Portsmouth, enjoyed an almost total exemption from sickness of every kind; and in the neighbouring villages and farm-houses on that side, only a mild regular Tertian ague prevailed, which however distressed whole families. The violence of the fever, with its appearances in a continued remitting or intermitting form, marked, in some measure, the nature of the soil. In Portsmouth its symptoms were bad, worse at Kingston, and still more dangerous and violent, at a place called Halfway-houses, half a mile from Portsmouth, where scarcely one in a family escaped this fever, which there generally made its first attack with a delirium. In the large suburb of Portsmouth, called the Common, it seemed to rage with more violence than in the town, some few parts excepted; but even whole streets of this suburb, together with the houses in the Dock-yard, escaped it.

The marines, who were three times a week exercised early in the morning on South-Sea Beach, from the effect of the stagnant water of an adjoining morass, suffered

fered much. Half a dozen of them at a time were frequently taken ill in their ranks, when under arms; ſome were ſeized with ſuch a giddineſs in the head, that they could ſcarcely ſtand; others fell down ſpeechleſs, and upon recovering their ſenſes, complained of a violent head-ach.

When ſuch patients were received into the hoſpital, ſome few had a regular ague, but far the greater number laboured under a remitting fever, in which ſometimes, indeed, there was no perceptible remiſſion for ſeveral days. A conſtant pain and giddineſs of the head were the moſt inſeparable and diſtreſſing ſymptoms of this diſeaſe. Some were delirious, and a few vomited a quantity of bile; in all, the countenance was yellow.

A long continuance of the fever produced either a dropſy, or a jaundice, or both; even a ſlight attack reduced the moſt robuſt conſtitution, to a ſtate of extreme debility; which, together with the giddineſs, continued long after the fever.

A ſcabby eruption now and then made its appearance on the lips, and the corners of the mouth: but dry itchy ſpots over the whole body, reſembling much the common itch,

and seeming to partake somewhat of the nature of that disease, were more frequently observed in several patients at Portsmouth, where there was not the least reason to suspect any infection.

The universality of this fever, together with its uncommon symptoms, were at first alarming; but when the lancet was withheld, and the bark freely given in large dozes, few died*. It decreased with the heat of the weather, and in the winter appeared chiefly under the form of a quartan ague. Under this form I shall have occasion to make farther mention of it in another place.

This may suffice for a brief description of the autumnal fever of Great Britain, which in its utmost violence prevailed in 1765, not

* When the head-ach or giddiness were very violent, and the pulse neither full nor strong, I ordered a blister to the back, and endeavoured to reduce the fever into an intermitting form, by giving half a grain of tartar emetic, with a few grains of nitre every six hours

Thus a perfect intermission was generally obtained, and the bark was then administered without delay. Vomits were useful, as was also the tinctura sacra, given as a purgative during the remissions. A blister to the back seldom failed to relieve the violent head-ach, which afflicted the patients, during the remissions of this fever.

only in Hampſhire, but in many other parts of this iſland, and which ſeemed to have been increaſed that year, by the unuſual and exceſſive heat of the ſummer, together with an undiluted putrid moiſture in the ſoil, and the long duration of eaſterly winds.

Let us now paſs over to the continent, and take a view of the ſtate of diſeaſes, in other parts of Europe at this ſeaſon of the year. In the Low Countries, particularly Zealand, the moſt obſtinate diſeaſes of this kind frequently rage, and are particularly diſtreſſing to ſtrangers.

Doctor Wind, in his tranſlation into Dutch, of my Eſſay on preſerving Seamen *, has among other judicious remarks, the following obſervation relative to what I have there ſaid of tertian fevers.

He obſerves, " that at Middleburgh, the " capital of Weſt Zealand, where his father " and himſelf had practiſed twenty-eight " years, a ſickneſs generally reigns towards " the latter end of Auguſt, or the begin- " ning of September, which is always moſt " violent after hot ſummers.

" It makes its appearance after the rains,

* Aanmerking XI.

" which generally fall in the latter end of " July; the ſooner it begins, the longer it " continues, being checked only by the " coldneſs of the weather.

" Towards the end of Auguſt, and the " beginning of September, it is a continual " burning fever, attended with a vomiting " of bile, which is called the gall-ſickneſs. " This fever, after continuing three or four " days, intermits, aſſumes the form of a " double tertian, and leaves the patient in a " fortnight, or perhaps ſooner; ſtrangers, " who have been accuſtomed to breathe a " dry pure air, do not recover ſo quickly.

" Foreigners in indigent circumſtances, " ſuch as the Scotch and German ſoldiers, " who are garriſoned in the adjacent places, " are apt, after thoſe fevers, to have a " ſwelling in their legs, and a dropſy; of " which many die.

" Fluxes are frequent in September and " October; towards the latter end of which " indeed the air becomes more healthy, and " then few diſeaſes prevail. At this time, " thoſe who have laboured under the fever " ſometimes ſuffer a relapſe; but then it is

" into

"into a ſimple tertian, which ſeldom con-
"fines the patient."

The Doctor farther obſerves; "That thoſe diſeaſes are the ſame with the double tertian fevers, common between the tropics. Such," ſays he, "as are ſeized with the gall-ſickneſs, have, at firſt, ſome fluſhes of heat over the body, a loſs of appetite, a white foul tongue, a yellow tinge in the eyes, and a pale colour in the lips. An emetic, adminiſtered before the gall-diſeaſe appears, is ſerviceable. Bleeding is ſeldom requiſite, unleſs in perſons of a plethoric habit. The gall-ſickneſs is removed chiefly by cooling medicines; but, in October, the tertian agues cannot be cured without the bark.

"Such as live well, drink wine, have warm cloathing and good lodgings, do not ſuffer ſo much during the ſickly ſeaſon as the poor people: however thoſe diſeaſes are not infectious, and ſeldom prove mortal to the natives.

The Scotch regiment in the Dutch ſervice has, at Sluys, been known to bury their whole number in three years.

It

It would greatly exceed the intended length of this Eſſay, ſhould I attempt to enumerate ſuch ſimilar diſeaſes as prevail annually in other countries of Europe during the autumn. I have elſewhere had occaſion to mention the epidemical diſtempers which rage in Hungary, and in the Campania of Rome, during the months of July, Auguſt, and September. The former, on account of its inſalubrity, has been, with propriety, termed the grave of the Germans; and with regard to the latter, Lanciſius, phyſician to Pope Clement the XIth, furniſhes us with a very ſtriking proof of the malignant quality of its air.

Lanciſius relates, that thirty gentlemen and ladies of the firſt rank in Rome, having made an excurſion, upon a party of pleaſure, towards the mouth of the Tyber, the wind ſuddenly ſhifted and blew from the ſouth over the putrid marſhes, when twenty-nine were immediately ſeized with a tertian fever, one only eſcaping.

But before we leave Europe, it may be proper to take a view of ſuch diſeaſes as prevail in unhealthy ſpots of its moſt ſouthern

parts,

parts, where the heat of the weather may be ſuppoſed to have great influence. For this purpoſe, the iſland of Sardinia ſhall be ſelected; of the diſeaſes of which I do not remember to have met with any printed account.

This iſland is annually viſited with an epidemical ſickneſs, which rages from June to September, and is called by the natives the Intemperies. In ſome ſummers, there is a want of rain for four or five months; and then it is that this ſickneſs exerts its utmoſt violence, being always more fatal in ſome places than in others, and particularly to ſtrangers. Of this the Engliſh had lately a very ſevere proof.—In the month of Auguſt, 1758, Admiral Broderick, in the Prince ſhip of war, anchored in the bay of Oriſtane, where twenty-ſeven of his men, ſent aſhore on duty, were ſeized with the epidemical diſtemper of this iſland; twelve of them in particular, who had ſlept on ſhore, were brought on board delirious. All of them laboured under a low fever, attended with great oppreſſion on the breaſt, and at the pit of the ſtomach; a conſtant reaching, and ſometimes a vomiting of bile; upon which

a delirium

a delirium often ensued. Those fevers changed into double tertians, and afterwards terminated in obstinate quartan agues. It is worthy of remark that in this ship, which lay only two miles distant from the land, none were taken ill but such as had been on shore, of whom seven died. The prior of a convent making a visit to the English officers, informed them,—that the Intemperies of the island was a remitting or intermitting fever; that he himself had suffered several attacks of it, and had taken large quantities of the bark and snake-root; but had always reaped the greatest benefit from a change of air. He observed, that during those sickly months, persons of rank left their country seats, and resided in cities; and that many poor people, especially in some parts of the island, who could not afford to take that precaution, were annually cut off by this epidemical sickness. The remedy used by the peasants is an emetic, administered immediately upon the first attack of the disease: this they prepare for themselves, by quenching some pieces of glass, heated in the fire, in a weak wine; which, thus medicated,

first

first acts as a vomit, and afterwards produces a copious sweat.

Sardinia was formerly so remarkable for its unwholesome air, that the Romans used to banish their criminals thither; and it is at present but thinly peopled, owing to the mortality occasioned by this annual sickness: for although it is about 140 miles long, and in several places 75 broad, yet it is computed, that the whole of its inhabitants does not exceed 250,000; an inconsiderable number, when compared with the inhabitants of the lesser, but comparatively more healthful island of Corsica, in its neighbourhood; though even there the French lately lost a number of their troops by intermitting and remitting fevers.

As to the English possessions in the southern parts of Europe, intermitting and remitting fevers, and the flux, are prevalent in the island of Minorca from June to November, and in some years are very obstinate. At Gibraltar the air is purer, and the situation more healthy.

SECT. II.

Of Canada, Newfoundland, Halifax, New England, Maryland, Virginia, South Carolina, Georgia, Florida, Mobile, Pensacola.

LET us now paſs over to America, and obſerve the various diſeaſes which attack ſtrangers in that part of the globe. We ſhall begin with the more northern parts of that continent.

In Canada, ſince that extenſive country has been in the poſſeſſion of the Engliſh, our troops and ſettlers have been remarkably healthy, if we except the great mortality occaſioned by the ſcurvy, in the winter of the year 1759. A ſurgeon, who practiſed long at Quebec, informs me, that true pleuriſies, and other inflammatory diſorders, were the genuine produce of the cold air of that climate; but that low bilious and intermitting fevers were ſcarcely known there.

The ſurpriſingly healthy ſtate of the ſhips companies, who annually viſit the banks of Newfoundland, and the long-continued

health enjoyed by thoſe, who paſs the winter at Halifax, are proofs that an intenſe degree of cold, properly guarded againſt, produces but few diſeaſes, and ſcarcely ever the fevers which are the ſubject of this treatiſe. It is a conſtant obſervation, that the men belonging to the Newfoundland fleet return every autumn to England, with much more healthy, and robuſt conſtitutions than they left it.

The climate of New England is ſimilar to that of Great Britain, and its diſeaſes the ſame. But travelling to the ſouthward, in Maryland or Virginia, where the heats are greater, and the ſoil more moiſt, eſpecially on lands not cleared, we find agues, fevers, and fluxes very diſtreſſing to ſtrangers; though the natives in general are pretty healthy, and ſometimes long-lived.

In South Carolina we find theſe diſeaſes much more obſtinate, acute, and violent. In that colony, eſpecially in the months of July and Auguſt, during the growth of the rice, the fevers which attack ſtrangers are very anomalous, not remitting or intermitting ſoon, but partaking much of the nature of thoſe which are ſo fatal to the newly ar-

rived

rived Europeans in West Indian climates. The same may be said of Georgia and East Florida, during these two months. In West Florida, the diseases of strangers approach still nearer to those of our West Indian islands.

At Pensacola, where the soil is sandy, and quite barren, the English have suffered much by sickness: some, for want of vegetables, died of the scurvy; but a far greater part of fevers. The excessive heat of the weather has sometimes produced in this place a severe fever, similar to that which in the West Indies goes under the name of the yellow fever. This, in the year 1765, proved very fatal to a regiment of soldiers sent from England, unseasoned to such climates, from the unfortunate circumstance of their being landed there in the height of the sickly season: It raged chiefly in the fort, where the air in the soldiers barracks, being sheltered from the sea-breeze by the walls of the fort, was extremely sultry and unhealthy. And it is worthy of remark, that during the fatal rage of this fever at Pensacola, such as lived on board the ships in the harbour escaped it. Pensacola however is of late

esteemed

eſteemed more healthy than Mobile, where intermitting fevers prevail in the months of July, Auguſt, and September. For theſe fevers, both in this and our other American colonies, we ſhall in general obſerve, that the bark has been found a ſovereign remedy, and ought to be adminiſtered on the firſt remiſſion of the fever, as on its early adminiſtration will greatly depend the preſervation of the patient's conſtitution.

Having now advanced near the tropic, before we proceed to deſcribe the diſeaſes in the Weſt Indies, it will beſt ſuit the purpoſe of this eſſay, and ſerve more fully to illuſtrate the nature of thoſe diſeaſes, that we direct our courſe to Africa, and afterwards to the Eaſt Indies, reſerving the account of ſuch as attack ſtrangers in the Weſt Indies to the latter part of theſe ſheets.

CHAP. II.

Most unwholesome Seasons and the Diseases in Africa.

SECT. I.

Of Algiers, Tunis, Tripoli, Morocco, Egypt.

THE state of good health commonly enjoyed by the subjects of almost all European nations, who live in a state of slavery, in the kingdom of Algiers, Tunis, and Tripoli, and in the empire of Morocco, leaves us no room to doubt of the salubrity of the northern parts of Africa. Even the most southern districts, in the empire of Morocco, are far from being unhealthy; Europeans there not only living to a great age, but commonly enjoying good health. The healthfulness of that climate clearly appeared from the unimpaired constitutions and healthful countenances of the late crew of his Majesty's ship Litchfield, of 50 guns, who, in the year 1758, were shipwrecked on that coast, and after remaining at Mo-

rocco

rocco upwards of seventeen months, returned to England in perfect health.

We must not however include Egypt among the number of the kingdoms in Africa, where Europeans enjoy such perfect health; the lower part of this country is rendered unwholesome by the annual inundation of the Nile, and the upper part being surrounded on three sides by large and extensive deserts of sand, is thereby exposed to the effects of that noisome vapour, which during the summer months, arises from sultry hot sand. The diseases produced from these causes *, are confined to certain months, beginning in May, and commonly ceasing in

* Some writers, who have attempted to account for the origin and cause of the plague in this country, do not seem to have been well acquainted with the nature of the winds and seasons in Egypt. Was it not for the inundation of the Nile, this country, in all probability, would have been rendered uninhabitable during the summer months, not on account of the filth of Grand Cairo, but on account of the hot winds from the deserts, which often begin here in the middle of April, and continue to blow for 30 or 40 days. The heavy dews which then fall in the night, serve in some measure to refresh the air: but when, by the increasing heat of the summer, the Samiel winds have acquired a pestilential violence, and a killing quality, then a sheet of water is, by the hand of Providence spread over Egypt.

 September.

September. It is is during these months, but especially towards the latter end of summer, that strangers are apt to be seized with bilious disorders, fluxes, and fevers *, similar to those in the southern parts of Africa, of which we are next to treat.

SECT. II.

Of the Coast of Guinea. Its soil, periodical rains, and heat. Its healthy and sickly seasons. Quantity and effects of the rains. Surprising effects of the harmattans. Comparative degrees of health in the different European settlements. Its diseases. The waters of the country examined. A proposal to prevent the Guinea worm. Whence the violence and mortality of diseases in Guinea. A journal kept in a voyage to Catcheou. Medical directions.

AFTER passing the great river Senegal, we come to Negroland, or what is commonly called Guinea. The inland parts of this country, except where the

* See Prosper Alpinus, Thevenot, Bruin, Paul Lucas, and others who have given accounts of Egypt.

course

courſe of a few rivers has conducted the Europeans, are little known to us, being viſited by no Chriſtian travellers, but the Armenians.

They are the greateſt travellers in the world, and the only people known to have lately viſited the inland parts of Ethiopia merely out of curioſity: but as they have publiſhed no relations of that country, Europe has reaped very little benefit by their travels. Several of them have made their appearance at Cape Corſo Caſtle, after having travelled through the Upper Egypt and Nubia, acroſs the whole continent of Africa; but for want of knowing the European languages, they could not make themſelves underſtood, further than by the draught they had made of ſeveral large cities, through which they paſſed.

The fartheſt the Europeans ever penetrated up the rivers, into this part of Africa, was, by means of the river Senegal, to the country of Galem, above 700 miles from the ſea. There the French eſtabliſhed a factory *, on account of the gold trade; which with

* Some idea may be formed of the rude ſtate of the interior parts of Guinea in general, from the account of

with their other ſettlements on that river, was ſurrendered to the Engliſh in the year 1758,

of this factory, related to me by a medical gentleman, who accompanied the firſt detachment of Britiſh troops which were ſent to take poſſeſſion of it. Their paſſage from Senegal, being againſt the ſtream, was upwards of ſix weeks; during which time they loſt in fevers more than a third of their number, and ſuffered exceedingly from the ſultry heat and moſquittoes.

On their arrival they found a ſmall fort, built on an eminence, at a winding of the river: the country on both ſides of the river was low, and covered with thick woods, except for the ſpace of half a mile round the fort; and on one ſide it was inhabited by blacks, on the other by Arabs, who, during the dry ſeaſon, wandered thither with their flocks for paſturage. Here all nature ſeemed to be at enmity with man. They were prevented from walking in the woods by tygers, who were ſo daring as often at night to attempt ſcaling the walls of the fort, and if by going armed or in ſmall parties they ſhould eſcape theſe, yet they were expoſed to the bites of venomous ſerpents, of different kinds, and many of a moſt extraordinary ſize: the ſhores of the river ſwarmed with crocodiles: the earth had its white ants, the air its wild bees, its ſand-flies, and its moſquittoes. Theſe inſects, though not the moſt tremendous, were perhaps their moſt diſtreſſing enemies. The ants devoured almoſt every article either of their proviſion or apparel; ſcarce any precaution could elude their art; they raiſed a hollow cylinder of earth perpendicularly towards their object, and through it, as by a ladder aſcended in thouſands: they were one of the greateſt torments to the ſick of that

climate

1758, upon the taking of Senegal, but has ſince been abandoned on account of its extreme unhealthineſs.

At

climate, and would reach the bed in a night's time, though hung at a diſtance from the ground; when their bites, like ſcalding water poured upon the ſkin, were more intolerable than the diſeaſe itſelf. The ſandflies and moſquittoes were exceeding numerous, and would have been eſteemed ſevere plagues, had not one yet more ſevere occurred, the wild bees, who ſwarmed in ſuch numbers, as to darken the air, and often hived in their rooms. Once or twice in a ſummer they were generally viſited by a ſwarm of locuſts, who came from the eaſt like a thick cloud, and eat up every thing that was green; but this was only a temporary inconvenience, as in eight or ten days the earth was clothed with a new verdure, and the trees put forth new leaves.

The whole animal creation here attained an unuſual degree of perfection. Droves of elephants, and oſtriches of a large ſize, frequently came down to the fort: the baboons were ſo numerous, that they made them their principal amuſement, they clothed them with the regimentals of the ſoldiers who died, they made them walk erect by tying their two fore-feet behind them, and in ſome reſpects even made them ſerve them in their houſes.

The ſultry heat of the weather was almoſt intolerable, even the night could not be deemed cool, and, when the wind came from the deſert, it ſcorched like a blaſt from the mouth of an oven. Annually the country was ſubject to an inundation of the river, from the heavy rains which fall periodically in that climate; theſe continued

At a diſtance, this extenſive coaſt appears in moſt places flat, and covered with low-ſuſpended clouds. On a nearer approach, there are generally perceived heavy dews, which fall in the night, and the land is every morning and evening wrapped up in a fog. Upon examining the face of the country, it is found clothed with a pleaſant and perpe-

for ſeveral months, and laid the country for a great extent under water; when the little fort defended by its high walls, appeared like a ſmall iſland in the midſt of a ſea. This was the ſeaſon of ſickneſs, and it ſwept off near one half their number; during it, the ſlighteſt irregularity or intemperance was productive of death; a company would one night meet and be merry, and before the next be the greateſt part of them in their graves.

The expectation of being relieved at the end of a twelvemonth made this wretched life ſupportable, but unfortunately next ſeaſon the mortality was ſo great among the ſoldiers ſent from Senegal to relieve them, that not above three or four reached the fort alive, the reſt died on their paſſage up the river. It was therefore impoſſible for the poor remains of the former garriſon to quit it, and they were obliged to drag out in it another year yet more tedious than the former; when the very few who remained alive were ſent back to Senegal with ruined conſtitutions.

Some miners were ſince ſent to this place from England, in order to inſtruct the natives in a proper method of working their gold mines, but were all cut off, partly by the natives, but moſtly by the climate.

tual

tual verdure; but altogether uncultivated, excepting a few ſpots, which are generally ſurrounded with foreſts or thickets of trees, impenetrable to refreſhing breezes, and fit only for the reſort of wild beaſts.

The ſoil is either marſhy, or watered with rivers or rivulets, whoſe ſwampy and oozy banks are over-run with ſedges, mangroves, and the moſt noxious weeds; the ſlime and filth on which ſends forth an intolerable ſtench, eſpecially towards the evening.

In this country, as in all others between the tropics, the ſun is vertical twice a year, and on his return from the northern tropic, is generally attended with heavy and continual rains. Theſe rains aſſuage the inſufferable heat, and allay the peſtiferous vapours, which in all probability would, in many places between the tropics, ariſe from the ground, particularly from the ſands, and by the powerful influence of a twice vertical ſun, might become deſtructive to animal life. It appears by a late obſervation, that at Senegal, the moſt northern extremity of Guinea, in December 1763, the heat was 93 degrees, meaſured by Farenheit's thermometer, and 98 at Sierra Leona, when the ſun

had made its moſt diſtant retreat from thoſe places. Hence we may in ſome meaſure judge what might be the effects of the perpendicular rays of the returning vertical ſun on the already heated ground, if thoſe countries were not ſheltered from their influence, by a thick clouded atmoſphere, and an almoſt inceſſant rain. This, as moſt tropical countries has, properly ſpeaking, only two ſeaſons, the wet and the dry; the former is commonly of about four months continuance, and is the ſeaſon of ſickneſs; whereas, for many months in the dry ſeaſon, moſt parts of this country are equally healthy and pleaſant with any in the world.

As in Europe the winter ſometimes ſets in ſooner, ſometimes later; in ſome years is very ſevere, in others mild; ſo in tropical countries, both the commencement of the rainy ſeaſon, and the quantity of rain which falls, vary in different years. At Senegal, the rains commence about the beginning of July, and continue till the end of October; in ſome ſeaſons they appear a few weeks earlier, in others a few weeks later. At Gambia they begin about a fortnight or three weeks ſooner than at Senegal; and down the

coaſt,

coaſt, their commencement becomes more early in proportion as the latitude decreaſes.

The quantity of rain which falls during the wet ſeaſon, is almoſt incredible. By obſervations made at Senegal, 115 inches depth of rain were found to fall in theſe four months, a quantity equal to that which falls in England during the ſpace of four years.

It is no leſs remarkable, that this great change in the weather has little or no effect on the barometer. In this inſtrument, when in Europe, the variations of the mercurial column are about three inches; but in the torrid zone, its variations are ſcarce perceptible. It is there but little affected by the moſt violent hurricane or the heavieſt rain; the quickſilver having been ſeldom obſerved to riſe above four tenths of an inch.

There are many difficulties which occur in aſſigning a ſatisfactory reaſon, why in ſome countries, as in thoſe between the tropics, heavy and continual rains ſhould produce ſickneſs, while in other places, eſpecially in the ſouthern parts of Europe, a want of rain, for two or three months in ſummer, ſhould have nearly the ſame effect, and bring on diſeaſes almoſt ſimilar.

In

In ſuch an uncultivated, ſwampy country as Guinea, one would hardly expect to hear of a ſeaſon of health; but what I have aſſerted is an experienced fact, with reſpect to newly arrived Europeans. For notwithſtanding ſuch, as conſtantly reſide there, retain, through all the ſeaſons of the year, evident marks of the inſalubrity of the climate, yet the indiſpoſitions, under which they labour, in the dry months, are generally the remains of their former illneſs, or the conſequences of what their conſtitutions had ſuffered, during the ſickly ſeaſon.

Upon this occaſion I cannot help obſerving, that there is hardly a phyſical cauſe which can be aſſigned for the production of any diſeaſe, that will not admit of ſome exceptions: thus not only the woods and moraſſes in Guinea are tolerably healthy in the dry ſeaſon, if we except Old and New Calabar, Benin, and ſuch like places; but a few inſtances might be produced, of towns ſurrounded with marſhes and a foggy air, where the inhabitants ſuffer no inconvenience from their ſituation, even during the rainy ſeaſon: as an example, take New Orleans in Louiſiana.

Do

Do the impetuous torrents of water poured from the clouds, during the rainy ſeaſons, in tropical countries, contain what is injurious to health? This much is certain, that in Guinea many of the principal negroes, and eſpecially the Molattoe-Portugueſe, take the utmoſt precaution to avoid being wet by thoſe rains, eſpecially by ſuch as fall firſt. At the ſetting in of the rainy ſeaſon, they generally ſhut themſelves up in a cloſe well-thatched hut, where they keep a conſtant fire, ſmoke tobacco, and drink brandy, as preſervatives againſt the noxious quality of the air at that time. When wet by accident with the rain, they immediately plunge themſelves into ſalt-water, if near it. Thoſe natives generally bathe once a day, but never in the freſh-water rivers, when they are overflown with the rains: at ſuch times they prefer for that purpoſe, the water of ſprings. The firſt rains which fall in Guinea, are commonly ſuppoſed to be the moſt unhealthy; they have been known, in forty-eight hours, to render the leather of the ſhoes quite mouldy and rotten; they ſtain cloths more than any other rain; and, ſoon after their commencement, the ground, even

in places formerly dry and parched, swarms with frogs. At this time skins, part of the traffic at Senegal, quickly generate large worms, and it is remarked that the fowls, which greedily prey on other insects, refuse to feed on these. It has been farther observed, that woollen cloths, wet in those rains, and afterwards hung up to dry in the sun, have sometimes become full of maggots in a few hours.

Is the sickness of those seasons to be ascribed to the intense heat of the then almost vertical sun, which frequently, for an hour or two at noon, dispels the clouds, and with its direct beams instantly changes the refreshing coolness of the air, into a heat almost insupportable?

As the season of those sudden and terrible storms called hurricanes in the East and West Indies, and tornadoes on the coast of Guinea, partly coincides with that of the rains; do these dreadful tempests in any measure contribute to produce the sickness prevailing at those times? It was remarkable one year at Senegal, that at the beginning of the rainy season, in the night succeeding one of these tornadoes, a great number of the

ſoldiers, and two-thirds of the Engliſh women, were taken ill, this garriſon having before been uncommonly healthy.

Laſtly, Is it not more probable, that, as in ſome of theſe countries, the earth, for ſix or eight months in the year, receives no moiſture from the heavens, but what falls in dews, which every night renew the vegetation, and reinſtate the delightful verdure of the graſs, the ſurface of the ground in many places becomes hard and incruſtated with a dry ſcurf, which pens up the vapours below, and, by the continuance of the rains for ſome time, this cruſt is ſoftened, and the long pent up vapours ſet free, which thence become the cauſe of ſickneſs? That theſe dews do not penetrate deep into the ſurface of the earth, is evident from the conſtant dryneſs and hardneſs of ſuch ſpots of ground, in thoſe countries, as are not covered with graſs and other vegetables. The large rivers in the dry ſeaſon being confined within narrow bounds, leaves a great part of their channel uncovered, which having its moiſture totally exhaled, becomes a ſolid hard cruſt; no ſooner the rains fall, than this long parched cruſt of earth and clay gradually

dually ſoftens, and the ground, which before had not the leaſt ſmell, begins to emit a ſtench, which in four or five weeks becomes exceedingly noiſome; at this time the ſickneſs is generally moſt violent.

In the Eſſay on preſerving Seamen, I have already given an account of the malignant and fatal vapours called harmattans, and the ſeaſons in which they infeſt ſome places on this coaſt. I have ſince found ſome perſons who cannot conceive, that a vapour or fog, ſhould open crevices in the wood, and make the boards ſhrink from one another. Upon this occaſion, I ſhall only ſay, that facts ſo well atteſted are too ſtubborn to bend to theory. A gentleman, who had long reſided at Cape Coaſt Caſtle, informed me, that during the time of this fog, being in the upper chambers of the fort, the boards of the floor ſhrunk ſo much, that he could diſcern the candles burning in the apartments below him (there are no plaiſter cielings uſed in thoſe hot countries) and that he could then even diſtinguiſh, what people were doing in the apartments below; the ſeams of the floor having opened above half an inch, while the fog laſted, which after-

wards,

wards, upon its being diſpelled, became cloſe and tight as before. I have already obſerved, that providentially thoſe fogs prove fatal only in ſome years, and even then only in particular places.—But to return from this digreſſion.

If, from the foregoing accounts, we form to ourſelves an idea of a low, uncultivated, woody country, laid under water, at a time too, when the heat of the air far exceeds any degree of heat ever experienced in England, we ſhall not be ſurpriſed to find, that ſuch, as are unaccuſtomed to the climate, ſeldom eſcape a fit of ſickneſs at this ſeaſon. If we farther take into conſideration, that the only ſpots of ground cleared in this country are low, damp, and annually overflown (ſuch being only proper for cultivation of rice, the common food of the natives) and to it add the blameable inattention of the Europeans themſelves to matters regarding Health, the violence and mortality of their diſtempers will be eaſily accounted for.

It is not uncommon, in many trading factories, to meet with a few Europeans, pent up in a ſmall ſpot of low, damp ground, ſo entirely ſurrounded with thick woods, that

they can ſcarcely have the benefit of walking a few hundred yards, and where there is not ſo much as an avenue cut through any part of the woods for the admiſſion of wholeſome and refreſhing breezes. The Europeans have alſo unfortunately fixed ſome of their principal ſettlements on low, inland, unventilated ſpots, on the foul banks, or near the ſwampy and oozy mouths of rivers, or on ſalt-marſhes formed by the overflowing of the ocean, where in many places the putrid fiſh, ſcattered on the ſhore by the Negroes, emit ſuch noiſome effluvia, as prove very injurious to health.

Notwithſtanding what has been ſaid, I think it will hardly admit of doubt, that if any tract of land in Guinea was as well improved as the iſland of Barbadoes, and as perfectly freed from trees, underwood, marſhes, &c. the air would be rendered equally healthful there, as in that pleaſant Weſt Indian iſland.

At preſent the Engliſh ſettlements, on the rivers Senegal and Gambia, are remarkably unhealthy; but otherwiſe, the northern, or what are called the windward parts of this coaſt, are the moſt healthy, eſpecially in

places

places or factories near the ſea. Thus the iſland of Goree, the town of Sierra Leon, the forts of Dixcove, Succondee, Cape Coaſt, and all the Engliſh, Dutch, and Daniſh forts on the Gold Coaſt, are, comparatively ſpeaking, healthier than the country to leeward of them.

The air in Whydaw is bad, but much worſe, nay in a manner peſtilential to Europeans, in the Gulph of Benin, even as far as Cape Lopez. As to the Portugueſe ſettlements to the ſouthward of that Cape, we obſerve, that St. Paul de Loanda, the capital of their dominions in that part of the world, is ſaid to be tolerably healthy, conſidering the climate; whereas the kingdom, and eſpecially the city of Benguella, are remarkable for a peſtiferous air.

The moſt healthy place, or the Montpelier, for its air, of the Portugueſe ſettlements in that diviſion of the globe, is the town of St. Salvadore. Notwithſtanding this lies 150 miles up the river Congo, or Zaire, and within ſix degrees of the equator, yet, from its being ſituated on a hill, and the neighbouring country being cleared of the natural woods and thickets, its inhabitants breathe a

temperate and pure air, and are in a great meaſure exempted from all the plagues of an unhealthy climate.

The leſs dangerous diſeaſes which attack Europeans in Guinea, are, the Dry Belly-ach, and the Guinea-worm, a worm which breeds in the fleſh. This is a white, round, ſlender worm, often ſome yards long, lodged in the interſtices of the muſcles, commonly in the legs, feet, or hands; when it attempts to eſcape through the ſkin, it occaſions a ſwelling, reſembling a boil, attended with great pain, until its little black head appears in a ſmall watery bladder, on the head of the boil. When this bladder breaks, the head of the worm is to be ſecured by tying it to a ſmall roll of linen, ſpread with plaiſter; and part of the worm is once or twice a day to be gently drawn forth, with care not to break it, and wrapped round this roll, until it be brought away entire; then the ulcer generally heals ſoon; but if part of the worm breaks off, the part remaining in the fleſh can be ejected only, by painful and tedious ſuppurations in different places. Dr. Rouppe obſerves, that the diſeaſe of the Guinea-worm is infectious. It may at leaſt be pru-

dent in Europeans, not to lie in the ſame apartments, and to avoid too free a communication with ſuch Negroes, as are afflicted with them. The Dry Belly-ach and Guinea-worm may be obſerved at any ſeaſon of the year, and ſeldom prove mortal. But the diſeaſes moſt fatal to Europeans, are fluxes and fevers. The latter make their appearance in the rainy ſeaſons.

I am informed by a ſurgeon, who practiſed ſome years at Senegal, that for ſeveral months during the dry ſeaſon, the country was as healthy and pleaſant, as any in the world; but ſoon after the rainy ſeaſon began, a low malignant fever conſtantly ſpread itſelf among the Europeans. It ſeemed to proceed from a poiſon, as it were, got into the ſtomach, beginning with ſevere reachings, and often with a vomiting of bile. Upon its firſt attack in this way, he adminiſtered a few grains of emetic tartar, and found, if this medicine operated both upwards and downwards, it generally relieved, and often entirely abated all the ſymptoms: but this lucid interval continued only a ſhort time; for commonly in ſix hours afterwards, the fever and vomiting returned, accompanied with a de-

lirium. The administration of a second emetic did not produce so good an effect, or a remission of the fever. A second remission was however sometimes accomplished by the Julepum è Camphorâ Pharmacopœiæ Londinensis, and the Haustus Salinus Pharmacopœiæ Pauperum Edinburgensis; then the bark was administered without delay. Those who were very plethoric were bled: but this operation gave only a momentary relief to the pains of the head and back. In some the fever was very malignant, and the patient died soon after its attack, the corpse appearing of a yellow colour, and the skin stained with livid spots or blotches. He seldom applied blisters, until the patient was comatose, and then he found good effects from them.

The bark ought to have been administered, immediately after the first remission of the fever was procured by the vomit. A more early application of blisters, in such low fevers, is also adviseable. It is worthy of remark, that the fevers of this country are particularly fatal to European women.

An inflammatory fever is seldom observed, during the season of sickness, in this part of the

the world. The flux chiefly occurs at this time, though it may ſometimes make its appearance at other ſeaſons, and is a diſtemper very common, and often fatal to Europeans in Guinea. The moſt mortal epidemic, however, is that low malignant fever of the remitting kind, which rages only in the rainy ſeaſon *.

The

* The following is an accurate deſcription of this fever, which raged on board the Weaſel ſloop of war, during the rainy ſeaſon at Gambia, in Auguſt 1769, taken from the journal of the ingenious Mr. Robertſon, ſurgeon of that ſhip.

"The ſymptoms are arranged according as the fever appeared in a more mild or more malignant form.

In its mildeſt form it began with a head-ach, a ſickneſs at the ſtomach, thirſt, univerſal uneaſineſs, and pain, eſpecially in the back and loins. The pulſe is ſmall and quick, the ſkin hot and dry. In the morning, theſe complaints were greatly relieved, in the evening exaſperated, which happened through the whole courſe of the fever.

About the third day, the violence of the ſymptoms increaſe, the tongue now becomes white and foul, the ſpeech weak and faultering, the thirſt inſatiable, the pulſe ſoft and weaker than natural.

On the third night, there was a gentle moiſture on the ſkin, likewiſe on this night ſeveral had profuſe ſweats.

On the fourth day, the patients loſe the ſenſation of taſte, and towards the evening become very hot and reſtleſs.

The Dry Belly-ach is the same disease here as in the West-Indies; but the Guinea-

On the fifth day, the weakness is increased. Hitherto the patients had not been confined to bed in the day-time.

On the sixth, frightful dreams, and an incipient delirium prevent them from sleeping.

On the seventh, they grow worse; their tongues are brown, dry, and chopped, the delirium is increased, with restlessness and universal uneasiness.

On the eighth, the remissions and exasperations happen as usual.

The ninth is the worst day; in the morning they are cool, but the symptoms soon return with increased violence.

Their pulse, since the sixth day, has been very irregular, and in general weaker than natural.

After this day there is a perfect remission of the fever, but towards night they become a little feverish till the seventeenth. The crisis of the fever is a gentle purging.

In the more malignant form of the fever, all the symptoms are more violent; there is from the beginning, a great prostration of strength and spirits, universal uneasiness, giddiness, violent reachings, a strong, quick, and sometimes a hard pulse, a white and dry tongue; sometimes a severe purging with gripes; at other times a bad cough, a violent pain and stricture over the eyes, and costiveness.

On the second day there is no alteration for the better.

About the third day, in the morning, there is a small remission, but in the evening they again turn ill.

On

nea-worm ſeems peculiar to Africa, and a few parts of Aſia. As it has been ſuppoſed to

On the fourth, ſcarce any remiſſion could be perceived.

When a remiſſion happened, it did not laſt above three hours; the patients ſeemed a little cooler, but their thirſt was not abated, and the palms of their hands, and the ſoles of their feet glowed with heat. Anxiety, reſtleſſneſs, and frightful dreams prevent them from ſleeping. Their memory begins to fail. The tongue in a few is white and furred, in moſt dry and chopped. Bilious vomitings and frequent looſe fetid ſtools have attacked ſeveral; but thoſe who were coſtive in the beginning ſtill remain ſo.

Fifth, in the night ſeveral were delirious: the tongues of ſome are become black, and the teeth furred.

Sixth, in the morning a few of them had a ſmall remiſſion, but all had been very ill in the night. The pain of the back and loins, giddineſs, and a pain at the bottom of the orbit of the eyes, are ſtill very troubleſome.

On the ſeventh, the delirium is more general, and in ſome the countenance is quite yellow, a wild look, heat of urine (not from bliſters) an inclination to vomit, and looſe ſtools, are frequent this day.

Eighth, A few after ſevere bilious vomitings and purgings, which ſtained like ſaffron, had purple blotches on the face and neck. In one patient a ſwelling of the parotid gland appeared. Delirium, ſtupor, cold ſweats, convulſive tremors and catchings, twitchings of the tendons, an involuntary diſcharge of urine and fæces, are frequent this day. The pulſe is very irregular.

Ninth, all the bad ſymptoms continued. The blotches roſe

to proceed from a bad quality in the water of the country, I procured the waters of Senegal,

roſe above the ſkin, and ſoon diſappeared; the patients thought themſelves better, while they remained on the ſkin. A bleeding at the noſe occurred in one of them, which alſo tinged yellow,

Tenth, a few had a ſlight remiſſion.

Eleventh, the dangerous ſymptoms continued; a large effuſion of blood under the ſkin appeared on one patient, on the right ſide of the face and neck, a little before his death.

Thirteenth, their countenances were much more yellow, and they were ſeized with a purging, but not attended with gripes. One of them had a gentle and univerſal perſpiration. He was afterwards cooler and his complaints were relieved. Among others, the bad ſymptoms ſtill remained; one was ſeized with faintings.

Fourteenth, the purging was attended with gripes: the patients continued cooler, but very weak, and the bad ſymptoms ſtill prevailed, with the ſubſultus tendinum.

Fifteenth, the bad ſymptoms continued: the ſwelling of the parotid gland in one patient was opened. Thoſe who had the purging and yellow countenance, were better: one had the piles.

Sixteenth and ſeventeenth, all continued better, except one man.

Eighteenth, a man who, for two days, had appeared to be in a very dangerous ſtate, fell into a ſound ſleep, followed by an equable perſpiration, which proved a happy criſis.

In one patient the fever continued till the twenty-firſt day, but it had been very mild during its whole courſe.

As

negal, Gambia, and Sierra Leon, to be ſent me in bottles, well corked and ſealed, in order

der

As to the critical days and ſymptoms that were moſt dangerous in this fever.

On the third day in the evening a perfect remiſſion was procured in one caſe.

In another caſe a remiſſion of thirty hours was obtained on the fifth day in the morning; but the fever afterwards returned for twelve hours with increaſed violence.

On the eighth day four died, and in one a ſwelling of the parotid gland formed. In the mildeſt ſtate of the fever, an imperfect criſis happened on this day.

One perſon died on the tenth, and on the eleventh three.

On the thirteenth one died, and many were ſeized with purgings, which proved a favourable criſis. In one, an equable perſpiration broke out, which was ſucceeded on the fourteenth by a gentle purging, and proved ſalutary.

On the fourteenth alſo, another patient died, who had had bleedings at the noſe, and blotches on the neck.

On the fifteenth, the ſwelling of the parotid gland was ripe for opening.

On the eighteenth, the unexpected criſis happened, in a very dangerous caſe, by means of a ſound ſleep and free perſpiration.

Coſtiveneſs, frequent diſcharges of bile, both by ſtool and vomiting, bleedings from the noſe, blotches, a brown, rough, and huſky tongue, a ſmacking of the lips, wildneſs of the countenance, and deſpondency of mind, were in every caſe mortal. A cough proved fatal in two caſes out of three, which third was the re-

markable

der to examine their contents. Upon opening theſe bottles, I found the water in all of them putrid, but the ſcent of the Senegal water was the ſtrongeſt and moſt offenſive. I could not, however, diſcover, by the help of a good microſcope, the leaſt appearance of any animalcules; nor did any chymical experiment diſcover uncommon contents or impurities in thoſe waters. All of them,

markable caſe that came to a criſis on the eighteenth day. An involuntary diſcharge of urine and fæces, except in two caſes, was alſo followed by death; in the firſt caſe, there was a ſwelling of the parotid gland; in the ſecond, an unexpected criſis happened on the eighteenth day. A pain either over the eyes, or deep within the orbit, faintings, drinking greedily and in large draughts, were dangerous ſymptoms. Upon feeling the pulſe, a diſagreeable ſenſation always remained on the fingers, eſpecially if there was moiſture on the patient's ſkin; but where the perſpiration proved critical, this did not occur.

Moſt of theſe patients were vomited and purged, when firſt taken ill. The mortality of the fever, it is ſuppoſed, was greatly leſſened by the ſhip leaving Gambia, and being at ſea. The captain, who was ill of it, took ten ounces of the bark. Hence we may in ſome meaſure judge how many pounds of that remedy would have been requiſite in the caſes of thirty or forty ſuch patients, on board even a very ſmall ſhip, and how far the allowance made to the ſurgeon for medicines, was adequate to this expence.

after ſtanding for ſome time expoſed to the open air, became perfectly ſweet and good.

Hence I am inclined to think, that the putrefaction of water deſtroys the living animalcules, and ſpawn, which it may contain when freſh; and if the water be permitted to putrefy, by being kept in cloſe, clean veſſels, and afterwards be ſweetened by expoſure to the air, very wholeſome water may be obtained in Guinea. And ſuppoſing the Guinea-worm to be generated from animalcula, or their ova, contained in the waters of the country, their production in the human body may probably be prevented, by drinking thoſe waters only, that have been rendered wholeſome by undergoing a previous putrefaction and expoſition to the open air.

The quickeſt method of ſweetening ſuch water is, by paſſing it through a ſeries of veſſels, placed under each other, having very ſmall holes bored in their bottoms, ſo that it may fall in ſmall drops, like a gentle ſhower of rain, through each of them, into a receiver fixed below. The wind, or air, having thus a free paſſage through the water,

divided

divided into small drops, will soon render it wholesome and sweet *.

But to return from this digression: fluxes and fevers, as I said before, are the distempers most fatal to Europeans on this coast; and the season of their appearance is during the rains, and for some short time after they have ceased.

There is a pretty exact uniformity in the appearances and nature of the fevers and fluxes which attack strangers in Guinea; only their malignity or violence, and the mortality proceeding from them, in the rainy season, are in proportion to the situation of the place, and its ventilation.

The natives themselves are not exempted from those diseases. They are in general short-lived, and perceive as various degrees of purity and insalubrity of the air, in different spots of their country, as are felt in Europe, or in any other part of the world. Generally black priests, natives of the country, are hired by the Portuguese to undertake the

* This method of freshening putrid water, was first discovered by the ingenious Mr. Osbridge, a Lieutenant in the navy, but not before published.

conversion of those of their own colour, who reside in unhealthy places: hence the missions at Rio Nunes and at Gigashore have been rendered both honourable and lucrative, to such black missionaries, as chose to undertake them.

We shall conclude our account of Guinea, with some extracts from the journal of the surgeon of a ship, which sailed up the rivers of that country.

" Upon the 20th of February, we sailed " from Lisbon, and on the 16th of March " arrived at the island of St. Jago. Here " we found ships of different nations, whose " crews, as also the white people on the " island, were perfectly healthy. The latter, " however, seemed to have been sickly, and " many of them were afflicted with ague- " cakes, or hard swellings on the seat of " the spleen.

" Upon the 5th of April, we sailed up " the river Gambia, and found all the Eng- " lish in the fort in perfect health. The " surgeon of the factory informed me, that " a relaxation of the stomach, and conse- " quently a weakened digestion, seemed to " bring on most of the diseases so fatal to

" Europeans,

" Europeans, in the sickly season. They
" were generally of a bilious nature, at-
" tended with a low fever, sometimes of a
" malignant, at other times of a remittent
" kind. Fluxes were also then prevalent,
" and often proved mortal to strangers.
" The flux sometimes appeared alone, at
" other times attended the fever, most fre-
" quently followed it.

" Upon the 12th of April, after sailing
" thirty miles up the river St. Domingo,
" we came to Catchou, a town belonging
" to the Portuguese, in latitude 12 degrees
" north. In this town there were only four
" white men, the governor and three friars.
" The number of white people in the trad-
" ing ships were fifty-one. One morning,
" towards the latter end of April, a little
" rain fell. On the 13th of May, there
" was a second shower, accompanied with a
" tornado. On the 18th of May, it rained
" the whole day; and the rain continued,
" with but short intervals, until the begin-
" ning of October.

" In the month of June, almost two-
" thirds of the white people were taken ill.
" Their sickness could not well be charac-

" terised

" terifed by any denomination commonly
" applied to fevers: it however approached
" nearest to what is called a nervous fever,
" as the pulfe was always low, and the
" brain and nerves feemed principally affec-
" ted. It had alfo a tendency to frequent
" remiffions. It began fometimes with a
" vomiting, but oftener with a delirium.
" Its attack was commonly in the night,
" and the patients, being then delirious,
" were apt to run into the open air. I ob-
" ferved them frequently recover their fenfes
" for a fhort time, by means of the heavy
" rain, which at that time fell upon their
" naked bodies. But the delirium foon re-
" turned: they afterwards became coma-
" tofe; their pulfe funk, and a train of ner-
" vous fymptoms followed; their fkin often
" became yellow; bilious vomitings and
" ftools were frequent. Vomits, blifters,
" camphire, and the bark, were the only
" things, which merited the title of reme-
" dies for this difeafe.

" The fever reduced the patient's ftrength
" fo much, that it was generally fix weeks
" or two months before he was able to walk
" abroad. A confuming flux, a jaundice, a

" dropsy, or obstructions in the bowels, " were generally the consequences of it. Of " fifty-one white men, being the compa- " nies of four ships which were at Catchou, " one-third died of the fever, and one- " third more of the flux, and other diseases " consequent upon it; of these not one was " taken ill, till after the rains began.

" I believe, on the whole face of the " earth, there is scarce to be found a more " unhealthy country than this, during the " rainy season: the idea I then conceived " of the situation of our white people, was " by making a comparison of their breath- " ing such a noxious air, with a number of " river-fish put into stagnating water, " where, as the water corrupts, the fish " grow less lively, they droop, they pine " away, and many die.

" Thus, some persons became dull, in- " active, or slightly delirious at intervals, " and without being so much as confined to " their beds, they expired in that delirious " or comatose state, in less than forty-eight " hours, after being in apparent good health. " The white people in general became yel- " low; their stomach could not receive " much

" much food, without loathing and reach-
" ings. Indeed it is no wonder, that this
" ſickneſs proved ſo fatal, that recoveries
" from it were ſo tedious, and that they
" were attended with fluxes, dropſies, the
" jaundice, ague-cakes, and other danger-
" ous chronical diſtempers.

" It ſeemed more wonderful to me, that
" any white people ever recover, while they
" continue to breathe ſo peſtiferous an air,
" as that at Catchou, during the rainy ſea-
" ſon.

" We were, as I have already obſerved,
" thirty miles diſtant from the ſea, in a
" country altogether uncultivated, over-
" flowed with water, ſurrounded with thick,
" impenetrable woods, and over-run with
" ſlime. The air was vitiated, noiſome, and
" thick, inſomuch that lighted torches or
" candles burnt dim, and ſeemed ready to
" be extinguiſhed; even the human voice
" loſt its natural tone. The ſmell of the
" ground and of the houſes was raw and
" offenſive; the vapour ariſing from the
" putrid water in the ditches which ſur-
" round the town, was much worſe. All
" this however ſeemed tolerable, when

 " com-

" compared with the infinite numbers of in-
" sects swarming every where, both on the
" ground and in the air, which as they
" seemed to be produced and cherished by
" the putrefaction of the atmosphere, so
" they contributed greatly to increase its
" impurity.

" The wild bees from the woods, toge-
" ther with millions of ants, over-ran and
" destroyed the furniture of the houses; at
" the same time, swarms of cock-roaches
" often darkened the air, and extinguished
" even candles in their flight; but the
" greatest plague was the musquitoes and
" sand-flies, whose incessant buzz, and pain-
" ful stings, were more insupportable than
" any symptom of the fever.

" Besides all these, an incredible number
" of frogs on the banks of the river, made
" such a constant and disagreeable croak-
" ing, that nothing, but being accustomed
" to such an hideous noise, could permit
" the enjoyment of natural sleep.

" In the beginning of October, as the
" rains abated, the weather became very
" hot; the woods were covered with abun-
" dance of dead frogs and other vermin,

" left

"left by the recefs of the river; all the "mangroves and fhrubs were likewife over- "fpread with a ftinking flime.—Upon our "return to Lifbon, I obferved the blacks "fuffered much from the change of cli- "mate; when they came into a cold lati- "tude in the month of December, many of "them were feized with the flux, and other "diftempers, of which feveral died."

From all that has been obferved it will clearly appear, that the moft frequent and fatal difeafes in the fickly feafon in Guinea are not of an inflammatory nature. Indeed fo much harm has been done there by the lancet, in the hands of fuch as have read only Sydenham's works, or authors who treat of inflammatory fevers only, that it is moft adivifeable for the inexperienced in fuch climates to abftain altogether from its ufe, and to truft the fafety of their patients, in fuch cafes, to vomits and the early applica- tion of blifters, together with the ufe of Tartarum Emeticum, in fmall dofes, or of antimonial medicines of gentle operation, during the fever, and of the bark upon its firft remiffion; which will be found the

most successful and judicious method of treating those fevers.

In dangerous cases, the bark ought to be administered in wine, to the quantity of an ounce and an half in ten or twelve hours, and an ounce every twenty-four hours afterwards. If rejected by the mouth, it may be given in clysters in double that quantity. Here it is proper to observe, that this remedy may be administered in large quantities with the utmost safety. I have often, in England, given an ounce of it in less than six hours, even when the stomach was weak, and the patient low, without observing the least inconvenience, sickness, or reachings. I have had patients, who in less than three weeks have taken fourteen ounces of the bark in substance; and in whom there was even an absolute necessity for their taking that quantity.

It should be considered, that Dr. Sydenham's judicious practice was local; it was confined not only to England, but to a particular and very healthy spot of it, London: and it is probable, that if the Doctor had practised at the distance of only a few miles

from

from the metropolis, in the low grounds in its neighbourhood, he would not have found the operation of bleeding ſo univerſal a remedy for moſt fevers. Had this eminent phyſician been acquainted with the uſual autumnal fever of ſeveral countries of Europe, and with the great mortality produced by it in hot climates, he would not have ventured to pronounce a continual fever, of about twelve or fourteen days duration, the moſt conſtant and primary fever of nature, to which the medical precepts of the ancient phyſicians were chiefly applicable. In this fever, after bleeding and a vomit, the ſafety of the patient was to be intruſted in a great meaſure to Nature, as the principal agent of the cure, which it was to effect by means of the fever itſelf, which was always thought the ſalutary inſtrument of a recovery; a practice and a theory by no means applicable to the fevers, which attack Europeans in Guinea.

The loſs of a ſmall quantity of blood, in the beginning of a fever, does often neither good nor hurt; and there are diſeaſes incident to Europeans in that part of the world, eſpecially in the dry ſeaſon, which may re-

quire even a repetition of that operation. But during the rainy or ſickly ſeaſon, in the caſe of Europeans labouring under the fever, it is ſeldom neceſſary to take away blood; and large and repeated bleedings are attended with fatal conſequences. Nothing can be a plainer proof of the diſpoſition of the air in this country, to produce remitting and intermitting fevers, than the common obſervation that thoſe who have had obſtinate agues in England or Holland, almoſt conſtantly ſuffer a relapſe when they come on this coaſt.

We are ſorry to ſay, that the ſick too frequently ſuffer in ſuch climates, from an unſkilful treatment, under the management of ſome, who may be really ignorant, or of others ſo totally devoted to a particular local ſyſtem of practice, as never to allow themſelves, either to act or to think contrary to its eſtabliſhed rules. In this work we ſhall therefore endeavour to ſuggeſt ſome medical hints, for the information of thoſe who have had no opportunity of acquiring experience, in the treatment of the diſeaſes of warm climates.—See Part III. Chap. I.

We take this opportunity, likewiſe, to inform

form them, that the directions here given relative to medical practice; not only on the coaſt of Africa, but in ſeveral other parts of the world, have been carried out of England by different gentlemen, and copies of them diſperſed in ſeveral of our factories abroad; where they have been experienced and approved, as the moſt ſucceſsful methods of treating fevers. In our ſettlements in Africa, ſeveral copies of them are yet to be ſeen, tranſcribed from what were given to Mr. Oates and others, ſeveral years ago; and I have frequently had the ſatisfaction of being informed, that they are now become the ſtandard rules of a regular and ſucceſsful practice, in that part of the world. Since the firſt editions of this Eſſay, the ſhips of war on the Guinea ſtation are ordered to be ſupplied, at the expence of government, with a large quantity of bark in powder, and of wine, to be iſſued occaſionally to the men who are ſent in boats, up rivers, or on ſhore; and inſtructions have been given to the commanders of theſe ſhips, not to permit any of their men to remain on ſhore after ſunſet: two circumſtances ſtrongly recommended in the courſe of this work, and which,

which, if strictly adhered to, must prove of the greatest utility.

SECT. III.

Of the Canaries, Cape de Verd Islands. The Islands of St. Thomas, Princes, Ferdinando Po, St. Helena. Cape of Good Hope. Madagascar. Mascarenhas. Mauritius. Eastern Shores of Africa.

BEFORE we take our leave of Africa, we shall take some notice of the African islands.

The Canaries are blessed with a temperate, pure, and wholesome air. No sooner were the English officers landed there, when brought sick from Senegal, than they found an immediate and satisfactory alteration in their health. There, they no longer were scorched with the fierce heat of a meridian sun, but found its warmth tempered with refreshing breezes, and a cool air; from which impenetrable surrounding woods had before debarred them. They were no longer sensible

ſenſible of the ſudden and piercing chillneſs of the evenings, nor tortured with ſwarms of blood-ſucking gnats and flies. It was ſurpriſing in how ſhort a time they recovered their health, ſtrength, and colour, in thoſe delightful iſlands.

Paſſing from the Canaries to the Cape de Verds; we find St. Antonio and St. Nicholas, the only two iſlands in that cluſter, where ſtrangers are exempted from a general ſickneſs during the rains. Theſe generally begin in July, and continue till November. This ſickneſs is ſtill more violent in the iſland of St. Thomas, Princeſs iſland, and Ferdinando Po.

In the iſland of St. Helena, to the ſouthward of all theſe, the Engliſh planters retain their health, complexion, and a vigorous conſtitution, during all the ſeaſons of the year, and live to as great an age as in Europe.

At the Cape of Good Hope the Dutch ſettlements are fruitful, pleaſant, and healthy. Paſſing theſe, we come to the large iſland of Madagaſcar. Here the companies of many European ſhips have been reſtored to health, when labouring under the ſcurvy, eſpecially if they arrived in the

dry ſeaſon; but during the rains, which in general continue from November till March, this iſland is very unhealthy, particularly the Bay of St. Auguſtine and Fort Dauphin, the two places where European ſhips commonly anchor. The Terpſichore, an Engliſh man of war, was a melancholy example of this, which from being there during the rainy ſeaſon, loſt a number of her men and officers.

The ſame may be ſaid of the Maſcarenhas, Mauritius, and the barren iſland of Diego Reys. The French fort at Bourbon is not however ſo unhealthy during the rainy ſeaſon, as the Bay of St. Auguſtine in Madagaſcar,

As to the eaſtern ſhores of Africa, we ſhall only remark, that Mozambique is reckoned unhealthy: and that the country of Quiola proved ſo fatal to the Portugueſe, that they were obliged to abandon all their ſettlements upon it: but that the great city and country of Melinda are ſaid to be tolerably healthy.

CHAP.

CHAP. III.

Most unwholesome Seasons and the Diseases in the East Indies.

SECT. I.

Periodical sickness in the English factories in Arabia and Persia, &c.

IN proceeding on our course to Arabia, Persia, and India, and taking a view, as we pass along, of the principal English factories established in those countries, we find, that at Mocha in Arabia, at Bassora in the gulph of that name, and at Gambroon in Persia, the European factors are annually subject to a periodical sickness, for four months in the year, from May to September.

In the East Indies, and in the southern parts of Asia in general, we find, that the countries which are well improved by human industry and culture, such as China *, and

* The numerous European factors who frequent China suffer no inconvenience from that climate, further

and ſeveral other places in that part of the world, are bleſſed with a temperate and pure air, favourable to the European conſtitution. On the other hand, the woody and uncultivated parts, ſuch as the iſlands Java, Borneo, and Sumatra, the coaſts of Arakan and Pegu, the iſlands of Negrais where the Engliſh lately attempted to make a ſettlement, Banda, one of the Dutch ſpice iſlands, and ſeveral others, have proved fatal to a multitude of Europeans and others, who have been accuſtomed to breathe a purer air.

In all parts of the Eaſt Indies ſituated near large ſwamps, on the muddy banks of rivers, or the foul ſhores of the ſea, the vapours exhaling from the putrid ſtagnated water, whether freſh or ſalt, from the corrupted vegetable and the other impurities, produce mortal diſeaſes, eſpecially during

ther than that, in the month of November the men in thoſe ſhips which lie near to Wampoa, in the river of Canton, are ſubject to agues, occaſioned by the north-weſt winds, which commonly blow at that ſeaſon, and paſs over ſome ſwampy rice grounds. This diſeaſe ſeldom proves fatal, but is apt to harraſs the patient for two ſucceeding months, if he continues on that ſpot. The Engliſh, whoſe conſtitutions have ſuffered by reſiding in the more unhealthy parts of India, find great benefit, by being removed to Canton.

the rainy ſeaſon. There is a place near Indrapour in Sumatra, where no European can venture to ſleep one night on ſhore during the rainy ſeaſon, without running the hazard of his life, or at leaſt of a dangerous fit of ſickneſs; and at Podang, a Dutch ſettlement on the ſame iſland, the air has been found ſo bad, that it is commonly called the Plague Coaſt. Here a thick peſtilential vapour or fog ariſes after the rains, from the marſhes, which deſtroys all the white inhabitants.

We proceed to take a general ſurvey of the ſtate of health, in the different European ſettlements, in this part of the world.

SECT. II.

The four Engliſh Preſidentſhips in India. Their comparative Degrees of Health. Diſeaſes.

THE Engliſh have in this part of the world four preſidentſhips or governments, to which all their other factories are ſubordinate, and upon which they depend, Madraſs, Bengal, Bombay, and Bencoolen.

The

The climate of Bencoolen has proved the most sickly of these, not only to the English, but to all who have been accustomed to live in a pure air. In the year 1763, upon the cession of Manilla to the Spaniards by the preceding treaty of peace, many Chinese merchants with their families quitted Manilla, in order to settle under the English government at Bencoolen: but the air of this country proved so fatal, that most of those Chinese and their families died soon after their arrival. Many English have also fallen a sacrifice to the intemperature of this climate; and indeed very few of them survived any length of time, until they built a fort on a dry elevated situation, at the distance of about three miles from the town. It is called Fort Marlborough; where, during the rage of sickness at Bencoolen, the garrison is frequently healthy.

Bengal, next to Bencoolen, of all the English factories, proves the most fatal to Europeans. The rainy season commences at Bengal in June, and continues till October: the remainder of the year is healthy and pleasant. During the rains, this rich and fertile country is almost quite covered by the

overflowing

overflowing of the river Ganges, and converted as it were into a large pool of water. Diseases rage among the Europeans in the months of July, Auguſt, September, and October, attacking chiefly ſuch as are lately arrived. Here, as in all other places, ſickneſs is more frequent and fatal in ſome years than others. The diſtempers are fevers of the remitting or intermitting kind; ſometimes they may begin under a continued form, and remain ſeveral days without any perceptible remiſſion, but they have in general a great tendency to a remiſſion. They are commonly accompanied with violent fits of rigors or ſhiverings, and with diſcharges of bile upwards and downwards. If the ſeaſon be very ſickly, ſome are ſeized with a malignant fever, of which they ſoon die: the body is covered with blotches of a livid colour, and the corpſe in a few hours turns quite black and corrupted. At this time fluxes prevail, which may be called bilious or putrid, the better to diſtinguiſh them from others which are accompanied with an inflammation of the bowels. In all thoſe diſeaſes at Bengal, the lancet is cautiouſly to be uſed.

It is a common obſervation, both at Bengal and Bencoolen, that the moon or tides have a remarkable influence there on intermitting fevers. I have been informed by a gentleman of undoubted veracity, and of great knowledge in medicine, that in fevers at Bengal, he could foretel the preciſe time when the patient would expire, it being generally about the hour of low water.

Thus much is certain, that in the year 1762, after a great ſickneſs, of which it was computed 30,000 blacks and 800 Europeans died in the province of Bengal, upon an eclipſe of the moon, the Engliſh merchants and others, who had left off taking the bark, ſuffered a relapſe. The return of this fever was ſo general on the day of the eclipſe, that there was not the leaſt reaſon to doubt of the effect *. However the moon's influence

* In this ſickneſs, a conſtant vomiting of a tough, white, pellucid phlegm, acompanied with a continual diarrhœa, was deemed the moſt mortal ſymptom. Bleeding was attended with fatal conſequences; but the adminiſtration of the bark, upon the leaſt remiſſion of the fever, with its continuance for ſome time afterwards, was recommended to every captain and ſurgeon of the ſhips, in the river of Bengal.

All

ence may operate, these obſervations furniſh a uſeful hint, which is, in ſuch ſituations, to take doſes of bark at the full and change of the moon, as being the ſeaſons found there to be moſt dangerous for an attack or relapſe into thoſe intermitting fevers *.

At

All navy and other ſurgeons, whoſe ſhips are bound to the Eaſt Indies, ſhould take with them ten times the uſual quantity of bark, and upon this account be excuſed from taking other drugs, not wanted in that climate, as bark cannot be procured there, without great expence and difficulty.

* As no accurate account has hitherto been publiſhed of the appearance of this fever in India, I will give ſome ingenious obſervations made on it at Bengal, in 1762, by my friend Dr. Lind, now of Windſor, which will alſo ſerve to prove the great ſimilitude of this fever with thoſe of other hot climates. "Impetus morbi plerumque ſubitaneus eſt, et encipit ſenſu debilitatis, "ac ingenti ſpirituum proſtratione; accedunt frigiditas modo major, modo minor, vertigo, nauſea, "capitis et lumborum acerrimi dolores, manuumque "tremores; vultus eſt pallidus, cutis vulgo arida et "conſtricta, oculi languidi ac graves, celer, at exilis "pulſus, anhelitus plerumque difficilis et ſingultibus "interceptus.

"Progrediente paroxyſmo, algores caloribus vagis "intermiſcentur; hicce calor brevi factus violentus "permanet, augetur nauſea, et in quibuſdam vomitus "ſupervenit, unde magna copia bilis rejicitur; nec "raro per alvum bilis quoque dejiciebatur; rubeſcit

"cutis,

At Bombay the air is more wholesome than at Bengal; and in general the whole coast

" cutis, tumidi occuli et interdum haud parum inflam-
" mati sunt: pulsus evadit plenior, et anhelitus dif-
" ficilior, cum magna inquietudine, et siti importuna;
" attamen, propter nauseam, potiones æger fastidit
" omnes; lingua fit sordida; ac dolores capitis et lum-
" borum ingravescunt; delirium supervenit; lenis in
" facie apparet mador, qui sensim deorsum diffusus,
" decrescente symptomatum violentia, remissionem in-
" stare demonstrat, eaque profusis sudoribus perficitur.

" Remittente febre, pulsus fere ad naturalem con-
" ditionem redit; manet tamen capitis atque lumborum
" dolores, licet leviores, ut et sapor oris ingratus, ac
" prostratus appetitus.

" Ingravescente morbo, remissionem vix notabilem
" mox sequebatur alius paroxysmus, qui sane haud ita
" magno tremore incepit; majore tamen capitis dolore,
" summa sollicitudine, cardialgia, nausea, vomitu, bi-
" lisque dejectionibus; vomitus et dejectiones tamen
" plerumque albi coloris erant calcis aqua commistæ,
" vel lactis illius quod lactentes evomunt, adinstar,
" quando materia coagulata plurinum contrita est.
" Fervor, immodica sitis, ac deliria eveniunt. Lingua
" evadit squalidior, ac, una cum dentibus et interiore
" labiorum parte, nigra crusta obtegitur; spiritus calet
" fœtetque; inchoatur de novo remissio cum sudore;
" ea tamen spatio temporis est brevior, nec æque ac
" prior conspicua.

" Alteram hance remissionem sequitur paroxysmus, in
" quo symptomata prioribus longe erant violentiora;
" vomitus ac dejectiones magis fœtebant; lingua, den-
" tes,

coast of Malabar is tolerably healthy. The island of Bombay has of late been rendered much

" tes, ac labiorum interiora non modo atra integebantur
" crusta, verum lingua adeo arebat rigebatque, ut voces
" parum distincte efferrentur; deliria gravia, inquietu-
" do, et molestia, durante pyrexia, maxime fiebant; nec
" prius tollebantur, quam supervenerint remissio ac su-
" dores.

" Si febris ita invaluerit in tertio paroxysmo, ut mors
" sequitur, quod sæpius obtigit, nonnulli ægri comatosi
" evaserunt; in alis delirium est vehementius. Excreta
" fœtida, ac haud secus quam cadaver olent; exonera-
" tiones sunt involuntariæ; pulsus celer, exiguus, et
" irregularis, adeo ut vix dinumerare aut sentire queas;
" gelidus toto manat corpore sudor, præcipue circa ca-
" put et collum; facies fit Hyppocratica, et convulsa;
" ægroti stragula carpunt, et floccos legunt; subit
" tendinum subsultus; in tergo solum recumbunt, sen-
" sim ad imam lecti partem dilabuntur; extremitates
" evadunt frigidæ ac lividæ; dein corripiuntur con-
" vulsionibus, quæ tragœdiam claudunt.

" Vis solis ac lunæ ad Bengalam mirabiliter ad reci-
" divam hunc morbum perpessos proclives efficit; unde
" hanc inter causas excitantes morbe annumerare possu-
" mus, est enim ita insignis, ut ægrotus, qui octo aut
" decem diebus convaluit, in summum recidivæ adduc-
" tus fuerit periculum, antequam lucidum cœli decus
" plenum orbem impleat, aut sub interlunium, ni cor-
" tex Peruvianus inhibendi causa detur. Documenta
" tam multa sunt ac res ipsa ita cunctis Bengalæ de-
" gentibus innotescit, ut modo dixisse sufficiat. Quos-
" dam ipse vidi qui nonnisi sub ipso plenilunio et in-

much more healthy, than it was formerly, by a wall which is now built, to prevent the incroachment of the sea, where it formed a

" terlunio paroxysmum, et tum unicum tantum, ha-
" buer; equi tamen facili negotio arceri potuit, si cor-
" tex Peruvianus paucos dies ante expectatum acces-
" sionis tempus exhibitus, ac usque quo illud sit elapsum
" continuatus fuerit, in hujuscemodi casu febricitanti
" cuidam puero mauro ipse sanantes porrigebam manus,
" morbum usque ad quatuor paroxysmos quovis pleni-
" lunio et interlunio tuto redeuntes permisi, ut prius
" rem ipsam exploratum haberem, quam corticem co-
" ercentem admoverem.

" Nov. 16. Cal. Ann. 1762. Tempore pomeridiano,
" solem haud parum lumine defectum vidimus; ac cum
" antea sub serena cœli facie, ex nimis æstu laboramus,
" mox inter maximam obscurationem aër multum al-
" gebat. Tunc temporis remittens febris, qua teneba-
" tur D. Macquire à præfecto in concilio tertius, su-
" beunte solis defectu, exacerbata est; eodem vero tran-
" seunte, evanuit. Ægroti vero qui tum nostra sub
" cura erant non admodum afficiebantur.

" Subitos ac violentos lunæ effectus tem præcipue ob-
" servavimus quarto nonas Novembris, hora circiter se-
" cunda matutina, quo tempore terra interposita radios
" intercepit solares; in eo temporis articulo haud pauci-
" ores octo nautarum ex nave Drake, qui ad Calcuttam
" in ædibus præfecti navis ex febribus convalescebant,
" eodem fere temporis puncto, vehementissimo paro-
" xysmo sunt correpti; et idem plurimis evenit qui in
" nave fuere collegæ nostri curæ demandati." *Diss. Inaug. Med. De Febre Putrida in Bengalia Ann.* 1762. *Aut* Jac Lind.

salt

ſalt marſh, and by an order, that none of the natives ſhould manure their cocoa-nut trees with putrid fiſh. The rains begin here ſometimes in May, but more frequently in June, and for four months are very violent.

At Surat and Tellicherry, on the ſame coaſt, Europeans commonly enjoy a good ſtate of health.

Madraſs is the moſt healthy government belonging to the Engliſh: and in general the air of the whole coaſt of Coromandel is pure and ſalubrious, in reſpect of moſt other parts of India. This is fully evinced by the good health Europeans enjoy, not only at Madraſs, but at St. David's, Cudalore, Maſſulapatam, Viſagapatnam, and at Negapatnam the Dutch preſidentſhip on this coaſt. The rains do not begin on this coaſt until October, and continue during the months of November and December. The more violent the rains are, the ſhorter is their duration. The quantity of rain, however, which falls at Madraſs, is conſiderably leſs than what falls either in Bengal or on the coaſt of Malabar.

SECT. III.

The ſettlements of other European nations in India. Medical directions. Mr. Ives's curious obſervations made in a journey from India to Europe by land.

MANILA, in the iſland of Luconia, on account of the purity and healthy temperature of its air, may juſtly be reckoned the Montpelier of all the ſettlements eſtabliſhed by European nations, in that quarter of the globe: but even this, during ſome months of the year, is unhealthy.

The Daniſh ſettlement at Tranquebar is healthy, as evidently appears from the florid countenance of the Danes in that place.

Pondicherry, the capital of the French in India, is far from being unhealthy. Goa, the reſidence of the Portugueſe viceroy in India, is tolerably healthy. Batavia, the capital of the Dutch dominions, is annually ſubject to a fatal and conſuming ſickneſs.

From familiar obſervation, the fatal errors committed by the young and thoughtleſs, ceaſe to excite our wonder; but we are apt

to

to be ſtruck with aſtoniſhment, when we find that the founders of great towns, and the governors of extenſive provinces, through ignorance or miſtake, have expoſed populous and magnificent cities to an annual and peſtilential deſtruction. This ſeems to be the caſe with Batavia; the Dutch, in endeavouring to make this their capital in India to reſemble their cities in Europe, have adorned it with canals or ditches interſecting each other, and running through every part of it. Thoſe canals, filled with water, may ſerve for ſome uſe, or perhaps ornament; but notwithſtanding the utmoſt care to keep them clean, in the hot and unwholeſome climate of Java, during and after the rainy ſeaſon, they become extremely noxious to the inhabitants, and more particularly to ſtrangers. The unwholeſome air of that place alone has cut off more Europeans than have fallen by the ſword, in all the bloody wars carried on by the Dutch, in that part of the world. In June the rains begin; in July and the ſucceeding months, ſickneſs rages moſt.

It is remarkable, that in the war which terminated in 1763, the Engliſh ſhips of war

which

which touched at Batavia, suffered more by the malignant diseases of that climate, than they did in any other part of India, if we except a fatal scurvy which once raged in that fleet at sea. Soon after the capture of Manila, the Falmouth, a ship of 50 guns, went to Batavia, where she remained from the latter end of July to the latter end of January; during which time she buried 75 of her crew, and 100 soldiers of the 79th regiment, who were embarked on board her, not one person in the ship having escaped a fit of sickness, except her commander Captain Brereton. The Panther, a ship of 60 guns, was there in the years 1762 and 1764; both times unhappily during the rainy season. In the year 1762 she buried 70 of her men, and had 92 of them very ill when she left the place. In the year 1764, during a short stay, she buried 25 of her men: the Medway, which was then in company with her, lost also a great number of men.

The fever was of the remitting kind. Some were seized suddenly with a delirium, and died in the first fit; none survived the attack of a third fit. The surgeon of the Panther imputes his preservation to taking

as much of the bark every hour, in claret wine, as his ſtomach would bear, beginning the uſe of this remedy immediately upon the firſt remiſſion of the fever. We may form ſome idea of the Dutch practice in this part of the world, when we find that, by the advice of four of their phyſicians, the bark was adminiſtered to Captain Matheſon of the Panther, notwithſtanding a remiſſion of his fever could not be procured: ſuch was their confidence in that medicine. But that gentleman, with many of his men, fell a ſacrifice to the intemperature of the climate. Nor was the ſickneſs at that time confined to the ſhips: the whole city afforded a ſcene of diſeaſe and death: ſtreets crowded with funerals, bells tolling from morning to night, and horſes jaded with dragging the dead in hearſes to their graves. At that time a ſlight cut of the ſkin, the leaſt ſcratch of a nail, or the moſt inconſiderable wound, turned quickly into a putrid ſpreading ulcer, which in twenty-four hours conſumed the fleſh, even to the bone. This fact is ſo extraordinary, that upon a ſingle teſtimony, credit would hardly be given to it; yet on board the Medway, and Panther, they had the moſt

fatal

fatal experience of it, and suffered much from it.

Besides malignant and remitting fevers, which rage during the wet season, and for some time after it, in the unhealthy parts of India, Europeans, especially such as live intemperately, are also subject to fluxes, and to an inflammation or disease of the liver. This last is almost peculiar to India, and principally to the Coromandel coast.

Fluxes are seldom in India accompanied with inflammatory symptoms, the discharges being chiefly of a putrid or bilious nature. They are removed by administering a vomit, then rhubarb, and afterwards ipecacuanha, in small doses; and when the bile and other putrescent humours have been thus sufficiently evacuated, opiates, with a diet of rice, and such food as is antiseptic.

The disease of the liver is generally preceded by a high fever, a difficulty of breathing, and a violent pain fixed in the right side upon the seat of the liver, to which the sick person often applies his hand, seeking for relief. On its first attack, the patient should lose blood, and the part should be bathed with a warm, relaxing, and discutient fomentation;

mentation; or a blifter may be applied to it. When, by bleeding, the fever is fomewhat abated, and a gentle purge or clyfter has been adminiftered, immediate recourfe muft be had to Mercury, as a fpecific for this difeafe. A gentle falivation of 15 or 20 days continuance, muft be raifed by means of mercurial ointment, rubbed upon or near the affected part, together with the ufe of mercurial pills or calomel taken occafionally. The livers of thofe who die of this difeafe are found in a putrid ftate, refembling an honey-comb. I gave mercurials with good effect to a number of patients under my care, who came from the Eaft Indies, and who fuffered from a return of this difeafe, when in England. In three cafes, where mercury was not adminiftered, the liver came to a fuppuration, of which two of the patients died. The ufe of mercury in fuch cafes may appear empirical; but by the experience of all who have practifed phyfic in India, it has been approved as a fafe and excellent method of cure.

Sailors, who do not eat green vegetables, are apt to be likewife afflicted in India with the fcurvy, and with fcorbutic fluxes: for the

the cure of which, see my Treatise on the Scurvy. They are also very subject, in the East, as well as in the West Indies, to large and obstinate Ulcers of the legs *.

In

* I have been favoured with the following ingenious observations by Dr. Bogue of Titchfield.

" The diseases most fatal at Calcutta, while I was " there, in 1757, began with the rainy season, and were " obstinate putrid intermitting fevers. The cold fit, " which was excessively violent, continued often for " twelve hours; and as the fever returned every day, " the patients had not above four or five hours respite " from it. During the rains, and for some time after, " we had sick, at the same time, in this place, one half " of the men in the squadron under the command of " the admirals Watson and Pococke. Out of three " ships of the line, and a 20 gun ship, and those not " fully manned, we lost in six months upwards of 200 " men, most of whom died of these fevers.

" Camphire was found the best medicine in the fit. " Bark and other antiseptics were administered in large " quantities, after first giving an emetic, and emptying " the bowels. This fever reduced the patients in ge- " neral to such a weak state, that Mr. Ives, then sur- " geon of that hospital, judged it absolutely necessary " to give arrack in their boiled rice to those who were " on the recovery, or who had not the disorder in a " violent degree. He likewise generously supplied " them with Madeira wine.

" In the inflammatory fevers preceding the rainy sea- " son, bleeding with caution was found of service; but

" as

In India, the European women in general enjoy a much better ſtate of health than the men.

" as ſoon as the rainy ſeaſon ſet in, the lancet was ſel-
" dom or never uſed.

" A ſalivation generally cured the diſeaſe of the liver, " if the ſpitting was brought on before matter was " formed. In ſome the mercury produced a looſeneſs, " which alſo cured the patient. In inflammations of " the liver, when it adhered to the peritoneum, which " was generally the caſe, and a tumor appeared exter- " nally, it was ſeveral times opened with ſucceſs.— " Of which the following is an inſtance.

" A ſeaman, aged about thirty-five years, was ſent " very ill of the ſcurvy, in the end of May 1759, to his " Majeſty's hoſpital, under my care, in the abſence of " the ſurgeon, at Negapatnam, a Dutch ſettlement on " the Coromandel coaſt. Soon after his coming on " ſhore, he was ſeized with a ſcorbutic flux, and a few " days afterwards complained of a pain in his right ſide. " In theſe circumſtances, as the flux continued, and ſe- " veral livid ſcorbutic ſpots had appeared on his limbs, " with a contraction of both knees, I judged it impro- " per to give mercurials; ſo that a large tumor ſhewed " itſelf on that ſide, pointing externally, with matter " beginning to form. I forwarded the ſuppuration with " poultices; and on the 13th of July, in the cool of the " evening, being about a month after his firſt complain- " ing of the pain of that ſide, I laid the tumor open " about ſix inches, and let out near three pints of well " digeſted matter. I then introduced my hand into the " left lobe of the liver, which I found almoſt entirely

" ſuppurated,

men. Child-bearing is, however, peculiarly fatal to them at Calcutta; on which account

" suppurated, and containing several honeycomb cavi-
" ties, the edge of the liver adhering to the peritoneum.
" He was dispirited on the thoughts of its being opened,
" but bore the operation better than could be expected
" in that low state, to which he was reduced. I cau-
" tiously filled the cavity with dry soft lint, and gave
" him a julep, with the tincture of bark, to take fre-
" quently. Next morning after the operation, there
" was a large discharge of good matter, and I found
" one sinus leading obliquely down towards the navel,
" and another towards the back, each about two inches
" in length. I laid them both open to the bottom;
" and these were the only openings I had occasion to
" make, though I found another sinus leading towards
" the chest. That day I dressed him as before, and the
" next day, after having fomented, I threw into the
" cavity an injection of barley-water, and tincture of
" myrrh, which I repeated three or four times, until I
" thought the parts were sufficiently cleansed of mat-
" ter. I continued to dress with lint preferably to any
" other application, on account of its giving no un-
" easiness, and of its absorbing quality. I gave him
" the bark in substance, as soon as his stomach would
" bear it. During the first fortnight I dressed him twice
" a day, there being then a great discharge. The ca-
" vity afterwards filling up fast, and the quantity of
" matter lessening, he was dressed only once in 24
" hours, but still continued to take the bark. In three
" weeks the wound was not more than an inch deep,
" and

account it would be adviseable for them to retire to a more healthy situation, at the approach of their delivery.

Before

" and but two inches in length, florid granulations daily " forming; and towards the end of August, the parts " being almost cicatrised, the patient was sent on board " his ship to do duty, the admiral expecting every day " to meet the French squadron. He was killed on the " 10th of September following, in the action between " the English squadron commanded by admiral Po- " cocke, and the French by count D'Ache.

" In some of those whose liver came to a suppuration, " I have known instances where the matter has been so " acrid, as not only to corrode, but to dissolve the car- " tilages at the extremities of the false ribs, and like- " wise part of those ribs.

" The following observations were made on the bo- " dies of two persons who died of this disease, after the " liver had suppurated. In a man aged 60, I laid open " about seven inches in length of a very large tumor, " of the right lobe of the liver, pointing externally, and " let out at least two quarts of fœtid matter. I treated " it much in the same manner as the preceding case, and " for the space of one month, not without great hopes of " a cure, though the incarnation was always more slow " than in the other patient. He was seized with a flux, " that continued more or less until his death, which hap- " pened in five months after the opening of this tumor. " During the last four months, the appearances fre- " quently varied; sometimes they flattered, but not to " so great a degree as before he was seized with the

Before we leave India, we ſhall give ſome account of the ſettlement which the Engliſh lately attempted at Balambangan.

Balam-

" flux. The aliment was diſcharged undigeſted through " the ulcer, a little before he died; and on opening the " dead body, I found the right lobe of the liver almoſt " entirely conſumed, the remains adhering in part to " the ſtomach, in which there was an opening equal to " a half-crown piece, and through it the food has paſſed " to the liver. The left lobe was a little enlarged, and all " the bowels of the abdomen were in an inflamed ſtate.

" In the patient of another ſurgeon, upon opening " the thorax, the lower part of the right lobe of the " lungs was found ſlightly adhering to the diaphragm, " and its blood veſſels full and enlarged; the upper part " of that lobe, together with the left lobe of the lungs " and the heart, were all in a ſound ſtate. Upon in- " ſpecting the abdomen, that part of the right lobe of " the liver which lies contiguous to the ribs, was al- " moſt entirely ſuppurated through its whole ſubſtance, " as far as the diaphragm: where it had not ſuppurated, " the blood-veſſels were moſt of them ruptured. On " introducing the hand between the peritoneum and " liver, there iſſued, from two large abſceſſes, three " pints at leaſt of a crude ſanious matter. The right " lobe extended itſelf into the cavity of the breaſt of " that ſide, quite to the third true rib. The gall-blad- " der was in a healthy ſtate, and full of bile; the duc- " tus communis cholidochus was wholly free from ob- " ſtructions; but the omentum was partly mortified. " The ſtomach was ſound, but much diſtended with

" wind,

Balambangan is a small island, about 45 miles in circumference, which lies to the westward of Borneo, and is covered with sand and swamps. It remained uninhabited until the year 1773, when it was ceded to the English by the sultan of Sooloo, in lieu of a debt he owed the East India company. A governor, council, and proper establishment of officers, were then sent thither, with a detachment of European troops and sepoys for their defence; a colony of Malays

" wind, and the vessels on the intestines in a state of " plenitude. The kidnies, spleen, mesentery, and pancreas, were perfectly sound."

This gentleman again visited India in the year 1772, where he had, for three years, the superintendance of the naval hospitals. He is so obliging as farther to inform me, that when he was last in India, mercury was more in use on the Coromandel Coast, than it had ever been before. In bilious fluxes, when the common remedies failed, it was used with great success, either by unction or internally, obstructions in some of the viscera being then supposed to be the cause of the disease. Fluxes of long standing were seldom cured without it. In all bilious complaints, emetics were not so frequently given as formerly, being only intended to cleanse the stomach, but the greatest dependence was placed on mercurials, and purges given at a few days intermission, which was supposed to be the most natural method of carrying off the bile.

from Bencoolen, and another of Chinese, were also induced to settle there. For a few months these people continued in perfect health, but no sooner did the monsoon change, than sickness made its appearance; and it raged with such violence that scarce one in ten survived this monsoon. A large ship was sent to the settlement to be used as a floating factory, but was brought into a close harbour, where in respect of health it could be of no benefit. The seasons of health and sickness are here regulated by the direction of the wind, or monsoon; from October till April, during the north-east monsoon, the wind comes from the sea, and the settlement is perfectly healthy; but from April till October, during the south-west monsoon, the wind blows over the marshes both of this island and Borneo, and produces fevers of the most malignant nature, which frequently cut off even the stoutest men in 12 or 14 hours. Notwithstanding this island lies within ten degrees of the equator, yet it is not subject to the periodical rains which happen in Bengal, and upon the Coromandel Coast; twice a year only, in April and October, at the change of the monsoons

the

the weather is variable for about a fortnight, during which great ſtorms of wind and heavy ſhowers of rain are frequent. Sickneſs generally begins in eight or ten days after the weather has become variable, and even before the wind is fixed in the ſouth-weſt quarter: it reigns with equal violence in every part of that monſoon; and the ſun, though twice vertical in that period, ſeems in no reſpect to encreaſe its malignity.

In December 1773, the Royal Captain, a company's ſhip, which had been ſent from China, with proviſions and neceſſaries for this ſettlement, was ſhipwrecked on the coaſt of Palloan, about 80 leagues diſtant from it. The crew went in their boats to Balambangan; and in about two months afterwards, the captain with forty-two of the men embarked for England, leaving behind him on this iſland ſixty-three of the officers and men. The Engliſh and Malays had taken poſſeſſion of the iſland about a fortnight before their arrival, but by the loſs of this ſhip were deprived of all their ſupplies: however, until April, they ſuffered no inconvenience, but what ſcarcity of proviſions and want of neceſſaries muſt naturally cauſe

 in

in an infant colony; all remained in perfect health, not one died: upon the change of the monsoon in April, sickness suddenly appeared, and during the course of this monsoon it made such a rapid progress, that of the sixty-three officers and men, who were left behind of the crew of the Royal Captain, one only survived, Mr. Saunders, from whom I received this account, and he was distressed with a severe flux, which obliged him to go to China, in September, for the recovery of his health, which he obtained at sea upon his passage, even though the same monsoon continued. He left, indeed, three or four of that unfortunate ship's crew alive, but these he was informed afterwards died before the monsoon changed. All the council were dead before he left the settlement, except the governor, Mr. Herbert, who had resided upwards of thirty years in India, and long in the most unhealthy parts of it, at Batavia and Bencoolen. Not above five or six remained of the detachment of European troops, which had been sent there; and the sepoys, Chinese, and Malays, died in equal proportion with them. During this monsoon, such was the malig-

nant

nant diſpoſition of the air, that no wound would heal, even the ſlighteſt cut, or a moſquitoe bite when ſcratched, degenerated into a large ulcer; whereas during the north-eaſt monſoon, wounds eaſily healed; one gentleman even had his arm amputated during that monſoon, and quickly cured; an operation which during the other muſt have coſt him his life.

We ſhall conclude this curſory account of the diſeaſes in the Eaſt Indies, and of the comparative degrees of health enjoyed by Europeans in different parts of it, with a few extracts from Mr. Ives's accurate obſervations, made on his travels from India to Europe by land: this gentleman having for three years been ſurgeon to his Majeſty's naval hoſpital in the Eaſt Indies.

" After leaving the unhealthy kingdom " of Bengal, we arrived, on the 9th of March " 1758, at Gambroon in Perſia.

" The climate here is very unhealthy. " Few Europeans eſcape being ſeized with " putrid intermitting fevers, which rage " from May to September, and are often " followed with obſtructions in the liver.

" Mr. Parker, ſurgeon to this factory, is

" much esteemed for his medical know-" ledge. He has been so successful in prac-" tice, that the English, during his resi-" dence among them for two years past, " have buried only one of their number. " His method of treating those fevers is, " after the administration of an emetic, to " order two scruples of the bark, twelve " grains of the salt of wormwood, and " twelve grains of the powder of snake-" root, to be taken every hour. Seven or " eight doses of this medicine effectually " prevented the return of the fit, and a re-" petition of them, within six or eight days " after, secured the patient against any " relapse.

" Various authors who have treated of " Gambroon, do, as well as the present " English factory, impute its unhealthful-" ness, during the summer months, to the " noxious effluvia, with which the air is " contaminated, from the great quantities " of blubber-fish left by the sea upon the " shore, which very soon become highly " putrid and offensive.

" Upon the 30th of March we came to " the island of Karec, in the Persian gulph.

" Mynheer

"Mynheer Tullick, ſurgeon to this Dutch "factory, informed me, that in the rainy "ſeaſons, intermitting fevers and fluxes are "the uſual diſtempers.

"After ſailing up the river Tigris from "Baſſora, we arrived at Bagdat. In this "city, ſuppoſed to contain 500,000 ſouls, "a purple fever then raged; but though "it was computed that an eighth part of the "inhabitants were ill, yet the diſtemper "was far from being mortal. Here we "were informed, that the Arabs had broken "down the banks of the river near Baſſora, "with a deſign to cover with water the de-"ſarts in its neighbourhood. This, it "ſeems, is the uſual method of revenge "taken by the Arabs, for any injury done "them by the Turks in Baſſora; and was "repreſented to us as an act of the moſt "ſhocking barbarity, ſince a general con-"ſuming ſickneſs would undoubtedly be "the conſequence. This was the caſe fif-"teen years before, when the Arabs, by "demoliſhing the banks of this river, laid "the environs of Baſſora under water. The "ſtagnating and putrifying water in the ad-"jacent country, and the great quantity of

" dead and corrupted fish at that time lying " upon the shore, polluted the whole at- " mosphere, and produced a putrid and " mortal fever. Of this fever between 12 " and 14,000 of the inhabitants died; at " the same time not above two or three of " the Europeans who were settled there " escaped with life: so dreadful are the " effects of corrupt stagnating waters, in " such sultry climates! A Bashaw was " lately dispatched to Bassora, to use his " utmost endeavours to prevent this cala- " mity, by repairing the banks, and by " preserving the course of the river within " its proper channel.

" Towards the end of May we found the " heat of Bagdat excessive, and almost into- " lerable to our European constitutions. " We were advised by our friends to re- " main there until the month of October. " They represented to us the increasing " heat of the weather, and the violence of " it in the desarts of Arabia, but particu- " larly the danger in passing the desart of " meeting with that pestiferous and mortal " blast called the Samiel.

" This is a sudden gust of wind, to which

" travellers

"travellers are exposed in the desarts, sometimes towards the middle or the end of "June, but more frequently in the months "of July and August; when it brings instantaneous death to every man or beast "that happens to stand with his face towards it. Providentially however, a certain, though short, warning of its approach is given, by a sensible alteration of "the air. When this is perceived, all travellers, with their horses, camels, &c. "must lie prostrate upon the ground, with "their faces downwards, and their feet towards the Samiel, and continue in that "posture until it is passed, which is the "only means of safety. This pestiferous "vapour quickly passes, and commonly "does not expand itself far, but runs as it "were in streams of no great breadth; so "that travellers, at a few miles distance "from each other, are exposed to different "Samiels, and some may be so fortunate as "to escape them. The Samiels may be in "some measure shunned, by travelling only "in the night during those months in "which they occur.

"To avoid the great desart, when we left "Bagdat,

" Bagdat, we took the road to Mosul, and " on the 5th of July arrived at that city. " Hear I learned from a Carmelite friar, " who acted as physician to the Bashaw, " that the common diseases were ardent fe- " vers and dysenteries in the summer, and " intermitting fevers during the wet season. " I understood from him, that bilious ob- " structions and swellings of the liver were " as frequent here as in India. This place " had lately contained 300,000 inhabi- " tants; but a famine and the sickness " which followed it, had greatly reduced " the number.

" In our journey we passed through Ni- " zabin, a place remarkable for its bad air, " and bad water; which the same famine " and sickness had almost depopulated.

" After undergoing many difficulties, " we at length, on the 5th of August, ar- " rived at Aleppo*. As we performed " this long journey in the warmest months " of the year, I shall now relate what ef- " fect the intolerable heats had upon our " constitutions.

* For the diseases frequent in this place, see Dr. Russel's treatise on that subject.

" They produced an entire loſs of appe-
" tite, a faintneſs and gripes, with frequent
" and bilious ſtools; which greatly ex-
" hauſted our ſtrength. My ſtomach was
" often ſo weak, that it could receive only
" a little milk. Several of us became fe-
" veriſh, through the exceſſive heat, and
" were obliged to have recourſe to gentle
" vomits; ſometimes with good effect, to
" Dr. James's powders, to take off the fe-
" ver; and to ſmall doſes of calomel and
" rhubarb, to cleanſe the bowels from a
" ſharp and acrid bile. Though we were
" furniſhed with the moſt ample conveni-
" encies for travelling, which money, or
" the ſtrongeſt recommendations to the
" principal Chriſtians, as well as Maho-
" metan chiefs, could procure, and had laid
" in a quantity of excellent Madeira, claret,
" and proviſions, &c. &c. yet moſt of us
" ſuffered in our conſtitutions, by this long
" and fatiguing journey.

" Such as travel this way in the ſultry
" ſeaſon, ſhould ſet out early in the morn-
" ing, or rather travel only in the night,
" and always, if poſſible, in a covered litter,
" called a Tackaravan.

" Travellers

" Travellers should seek for repose during " the heat of the day in a hut, or house if " it can be had, well sheltered with a close " thick roof;—or they should endeavour, " if possible, to sleep near the bank of a " river, in which case a single tent, not " painted, will afford an abode the most " commodious, next to that of a house, if " the canvas be kept constantly wet by the " servants, from trenches full of water cut " round it.

" We found lemonade, made with the " extract or juice of lemons, the most grate- " ful and cooling drink, during the sultry " heats of the day; but a glass of strong " wine was absolutely requisite in the even- " ing, to repair our exhausted strength and " spirit. The stomach should never be op- " pressed with full meals.

" The traveller should not forget to pro- " vide himself with some alum, as the wa- " ter of the Euphrates and the Tigris, " though wholesome, is apt to be muddy. " We added a quarter of an ounce of pow- " dered alum to six or seven gallons of wa- " ter, and in about an hour and an half af- " terwards the water became quite pure and

" tranſparent. We found no inconveni-
" ence from the alum; and I am inclined
" to think alum is not only an excellent pu-
" rifier of thick muddy water, but that in
" hot climates it cools the body, and braces
" up its relaxed fibres *."

Mr. Ives having, ſince the firſt editions of this eſſay, publiſhed an account of his voyage to India and journey home by land, we may now refer the reader for further particulars to the work itſelf; where he will find many entertaining relations, and ſeveral excellent medical obſervations.

Since the ſecond edition of this eſſay, Dr. Clark of Newcaſtle, formerly ſurgeon of the Talbot Indiaman, has publiſhed a book, entitled, Obſervations on the Diſeaſes in long Voyages to hot Climates, and particularly on thoſe which prevail in the Eaſt Indies. It is chiefly a medical journal kept in two voyages to India. The principal reſult of the author's

* It is a practice with ſome apothecaries to put a ſmall quantity of alum in their diſtilled ſimple waters, when foul; which quickly renders them clear and tranſparent. Though this makes the water ſomewhat hard, yet the ſmall quantity requiſite for the purpoſe does not ſeem to make common water harder than Briſtol water, ſo much eſteemed in Jamaica and other hot countries.

author's experience during these voyages is, that the bark may be given with advantage in the malignant and remitting fevers in India, not only during remissions, but even during the exacerbations of the fever, and where the fever is continual.

A very accurate journal kept on a similar plan by Dr. Robertson, formerly surgeon of the Rainbow ship of war, during several voyages to the coast of Guinea, has also lately been presented to the public. It contains a faithful account of the diseases of that Coast. Some extracts taken from it, when in manuscript, are given in the preceding pages.

CHAP. IV.

Moſt unwholeſome Seaſons and the Diſeaſes in the Weſt Indies.

SECT. I.

Comparative degrees of health in the Engliſh ſettlements; in the French, the Dutch, the Spaniſh.

WE ſhall conclude this part of our ſubject with ſome obſervations on the Weſt Indies, and an account of the diſeaſes moſt common and fatal to Europeans, on their firſt arrival in that quarter of the globe.

The moſt healthy of all the Engliſh poſſeſſions in this part of the world is the iſland of Bermudas. Next to which is the iſland of Barbadoes, if we except that ſpot of ground upon which Bridge-town, its capital, is ſituated. The air in many parts of St. Chriſtopher's is alſo pure. That of An-

tigua is bad: and that of Jamaica is reckoned ſtill more unhealthy; though much leſs ſo, than it formerly was. The colour of the European inhabitants in the iſland of Montſerrat, is a proof of the ſalubrity of its air: the ſame may be ſaid of Nevis. In general, the rainy ſeaſon in thoſe iſlands happens in Auguſt, September, October, and November. In the ſituations lately pitched upon, for the principal Engliſh ſettlements on Granada, the Granadines, and particularly at Tobago, we are ſorry to obſerve the health of the inhabitants has been a point little attended to. In the iſland of St. Vincent, the town of Kingſton is rendered very unhealthy by an adjoining moraſs. It is to be hoped, that theſe new ſettlements will become more healthy, when the ſtagnating water is drained off; an effect which the heat of the ſun itſelf would in ſome places produce, if the woods were cut down.

With reſpect to the ſettlements of other European nations, we ſhall briefly obſerve, that the French ſettlement of Cayenne has proved very ſickly. The climate of St. Domingo is alſo unhealthy; that of Martinico leſs ſo. At Guadaloupe, Martinico,

and

and moſt of the other French Weſt India iſlands; there are low, ſwampy grounds, commonly called Baſſe Terre, which are particularly unhealthy, and parcelled out to ſuch poor and indigent foreigners, as will run the riſk of their health and lives in improving them.

The Dutch ſettlements at Surinam, St. Euſtatia, and Curaçoa, are all very unhealthy.

In different parts of the Spaniſh Weſt India dominions, the air varies greatly in point of purity, according to the ſituation of places. Thus the city of Mexico is very healthy, while La Vera Cruz, its ſea-port, is remarkable for bad air. It is obſerved, that in the Weſt Indies the periodical rains, and the ſickneſs which attends them, are much more violent in the hot, marſhy, woody, and uncultivated places, upon the continent, than upon the adjacent iſlands; the inland provinces are, however, found to be in general more healthy than the ſea-coaſt. Were we to take a ſurvey of the whole coaſt of the Spaniſh continent in the bay of Mexico, we ſhould find few ſea-port

towns or rivers, during the rainy ſeaſon tolerably healthy *.

Shoals of large and ravenous ſharks crowding into the harbours, a dark thick cloud to the ſouthward, with thunder and lightning, ſlowly approaching, foretel the coming on of the ſickly ſeaſon, and are the awful preludes of thoſe impetuous torrents, which in a few days burſt from the clouds, and cover with water the whole face of the country. Theſe rains, by their continuance, ſo ſwell the numerous rivers, that the waters of the ſea are thereby rendered freſh for ſeveral miles, and muddy, almoſt to the diſtance of ten leagues from the ſhore.

Some of the harbours in the bay of Mexico, and thoſe generally the moſt ſecure, prove fatal to Europeans, beſides the uſual cauſes of ſickneſs, from want of a due ventilation. Thus in Port Maho, near the iſland of Rattuan, ſhips lie in a baſon of water ſo environed with high mountains, that the wind can have no acceſs to them; in this

* We ſhall have occaſion afterwards to mention many large and extenſive provinces in the Weſt Indies, which are bleſſed with a pure and wholeſome air.

reſpect, they ſuffer more than even at Engliſh harbour in Antigua. The ſtagnated air thence becomes ſo unwholeſome, that men, after being there a few days, are ſuddenly ſeized with violent vomitings, headachs, deliriums, &c. and in two or three days more, the diſſolved maſs of blood iſſues from every pore. In ſuch places, the water of the ſea itſelf would probably become putrid, and deſtructive to the very fiſh, was it not kept in motion, by a gentle flux and reflux, which may be perceived every day.

The bay of Honduras and the Moſquitto ſhore, although very unhealthy, are far better than Carpenters River and Rio Morte, or the River of Death, in the Gulph of Mexico. This laſt was ſo named by the Spaniards, from the death of all of that nation who at different times have attempted to make a ſettlement upon it; the Engliſh however have ſince, by ſettling on a different ſpot of ground, been more fortunate, and call it the New River.

It is a general obſervation that women enjoy a much better ſtate of health, in the Weſt Indies, than men, and are not ſo ſub-

ject to the yellow fever as them, owing probably to their more temperate way of living.

SECT. II.

Diseases of the West Indies. Account of the yellow fever; that disease shewn to be the common West India fever in a virulent degree; a disease similar to it at Cadiz. The French and Dutch accounts of the diseases in the West Indies. The dreadful mortality occasioned by them among the English at the Bastimentos, Carthagena, and the Havannah.

IN the West Indies, as in other unhealthy climates, fevers and fluxes are fatal to Europeans. The disease which is commonly called the yellow fever is particularly destructive to them.

Having considered this disease with attention, I am now* of opinion,—That the remarkable dissolution of the blood, the violent

* See my Essay on preserving Seamen.

lent hæmorrhages, the black vomit, and the other ſymptoms which characterize the yellow fever, are only accidental appearances in the common fever of the Weſt Indies. They are to be eſteemed merely as adventitious, in the ſame manner as purple ſpots and bloody urine are in the ſmall-pox, or as an hiccup in the dyſentery; like theſe, they only appear when the diſeaſe is accompanied with a high degree of malignity, and therefore always indicate great danger. They in general proceed from intenſe heat and a peculiar unhealthfulneſs of the air, though a groſs habit of body, exceſſive drinking of ſpirituous liquors, and being overheated in the ſun, may perhaps ſometimes diſpoſe to them.

The following obſervations made by Dr. Wind, will ſerve to illuſtrate what I have advanced.

"The Middleburgh, a Dutch ſhip of "war, ſailed from the Texel in Holland, on "the 25th of December 1750, and on the "12th of March 1751, entered the har- "bour of Curaçoa, with a healthy ſhip's "company; one only having died during "their paſſage from Europe. The air at

" Curaçoa was foggy and moist, and the " weather excessively hot; so that in the " beginning of April two very bad diseases " distressed the crew; a putrid dysentery, " attended with great pain, stench, and hic- " cup; and also a violent fever, accompa- " nied with the black vomit.

" They sailed on a cruize the 17th of " April. The weather at sea was then " moist and rainy: the diseases still conti- " nued, but not in so violent a degree as in " the harbour. Those who laboured under " the dysentery, were not at sea attacked " with the hiccup, and its other bad symp- " toms; neither did the black vomit seize " those who had the fever, as when in the " harbour.

" None of those taken ill at sea died of " either of these distempers: but when the " ship returned into the harbour, in the " latter end of April, the former dangerous " symptoms returned; the hiccup attended " the dysentery, and the black vomit ac- " companied the fever, the number of the " sick was greatly increased, and several of " them died."

I am very sensible, that one or two per- sons

ſons may ſometimes be ſeized with the yellow fever, when no other perſon in the neighbourhood labours under it; and even that at ſuch a time its moſt mortal ſymptom, the black vomit, may attack a perſon newly arrived, without any previous complaint. But from thence we can only infer, that a perſon may be ſuddenly ſeized with the worſt ſymptoms of a malignant fever, during a very healthy ſeaſon.

This happens daily in all parts of the world. Nothing is more common, than a perſon being attacked with an obſtinate ague, or flux, in the moſt healthy ſeaſons and countries: and patients are often afflicted with a petechial fever, when it cannot be attributed to contagion. But ſuch caſes are not the preſent object of our attention, as we treat only of epidemic ſickneſs from general cauſes.

I have peruſed many Engliſh accounts, both in manuſcript and print, of this fever, in moſt of which the authors have agreed only in the common epithet of yellow, from the ſkin's being frequently tinged with that colour. But the ſame appearance is alſo uſual in moſt intermitting fevers, in

ſome

ſome contagious fevers, and in many other fevers, ſo cannot properly be a diſtinguiſhing mark of this.

This fever* has been ſuppoſed by ſome to have been firſt imported to the Weſt Indies by a ſhip from Siam: an opinion truly chimerical; as ſimilar diſeaſes have made their appearance, not only in the Eaſt and Weſt Indies, but in ſome of the ſouthern parts of Europe, during a ſeaſon when the air was intenſely hot and unwholeſome. This happened at Cadiz in Spain in the months of September and October 1764, when exceſſive heat, and want of rain for ſome months, gave riſe to violent, epidemic, bilious diſorders, reſembling thoſe of the Weſt Indies, of which an hundred perſons often died in a day. At this time, the winds blew moſtly from the ſouth, and, after ſun-ſet, there fell an unuſual and very heavy dew.

This diſeaſe began commonly with alternate ſlight chills and heats, nauſea, pains of the head, of the back, of the loins, and at the pit of the ſtomach. Theſe ſymptoms

* See ſeveral particulars relative to this fever, and the method of treating it, in Part III. Chap. I.

were

were often followed, in less than 24 hours, with violent reachings, and a vomiting of a green or yellow bile, the smell of which was very offensive. Some threw up an humour black as ink, and died soon after, in violent convulsions, and in a cold sweat. The pulse was sometimes sunk, sometimes quick, often varying. After the first day, the surface of the body was generally either cold, or dry and parched. The head-ach and stupor often ended in a furious delirium, which proved quickly fatal. The dead bodies having been examined, by order of the court of Madrid, the stomach, mesentery, and intestines were found covered with gangrenous spots. The orifice of the stomach appeared to have been greatly affected, the spots upon it being ulcerated. The liver and lungs were both of a putrid colour and texture. The stomach contained a quantity of an atrabilious liquor, which, when poured on the ground, produced a sensible effervescence; and when mixed with spirit of vitriol, a violent ebullition. The dead bodies turned so quickly putrid, that at the end of six hours their stench was intolerable, and in some of them,

them, worms were found already lodged in the ſtomach.

His Majeſty's ſhip the Tweed being at that time in Cadiz bay, ſeveral of her men were taken ill when on ſhore; but by being carried on board, all of them recovered. Neither did the black vomit, or any other deadly ſymptom of that fever, make its appearance in any of the ſhips. The dread of this diſtemper forced many people of faſhion to retire into the country; where they remained, in perfect ſafety from it.

Phyſicians of other countries, ſuch as the French and Dutch, give various names to the Weſt India fevers; neither do they agree in aſſigning the ſame names, even to the ſame diſtempers.

Two French phyſicians, who both practiſed in the iſland of St. Domingo, have lately publiſhed an account of the diſeaſes prevalent in that iſland*. The firſt, Dr. Chevalier, informs us, that almoſt all Europeans who come to St. Domingo, not only

* Lettres ſur les Maladies de St. Domingue, par Chevalier, M. D. &c. Traité des Fievres de l'Iſle de St. Domingue, par Poiſſonniere Deſperieres, M. D.

from Europe but from North America, are, ſoon after their arrival, attacked with a malignant fever, formerly called Maladie de Siam, which differs from the autumnal fever, uſual in France only in being a more violent and a more dangerous ſickneſs. A later phyſician, Dr. Poiſſonniere, who practiſed three years in that iſland, ſays, the moſt frequent and fatal fevers, which attack Europeans newly arrived at St. Domingo, are either the true Cauſus, or ardent fever, in a violent degree; or another diſtemper, which is ſtill the Cauſus, or ardent fever, but in a leſs dangerous form. Both theſe French authors agree, that the air of this iſland is healthy to the natives, and to ſuch Europeans as have been ſeaſoned to the climate. But they do not ſeem to have had proper opportunities of obſerving the worſt ſymptoms, which attend the diſtempers, ſo peculiarly fatal to Europeans, on their arrival in the Weſt Indies.

Dr. Rouppe, a Dutch phyſician, has, in my opinion, furniſhed us with the beſt deſcription of theſe diſeaſes, as they appeared, when raging with their utmoſt violence, in a Dutch ſhip of war, at the iſland of Cura-

çoa,

çoa, and has assigned the most proper epithets for them, viz. colliquative, putrid, and spotted fevers, the cholera, and dysentery; or, as we may otherways translate them, malignant fevers, violent bilious disorders or the black vomit, and the bloody flux. I have in a note given his own words, as no account can be more full and clear*.

There

* Anno 1760, primo die Augusti, ad insulam S. Eustachii appulimus .... Die undecimo ejusdem mensis, ad insulam Curaçoa direximus iter ..... Die decimo nono, portum Curaçoa intravimus, et tunc viginti ægrotaverunt; inter quos nonnulli capitis doloribus sine febre, nonnulli vero colica biliosa laboraverunt, sed levi cura in pristinam sanitatem restitui poterant. Rouppe de Morb. Navigant. pag. 68, 69.

In initio commorationis, (apud insulam Curaçoa) uti supra diximus, morbi, qui maxime occurrebant, fuerunt capitis dolores, colicæ biliosæ, sanationem facile admittentes; hæ vero mutabantur in cholericas affectiones, primis longe graviores, periculosioresque, quibus mire, excruciabantur ægri. Inceperunt autem cum ingenti ardore circa præcordia, alvi torminibus, miro angore, et inquietudine, quæ subsequebantur biliosæ dejectiones, tam per superiora quam per inferiora, cum ingenti virium prostratione; multi sudore perfundebantur frigido; hæc si perrexerint, imprimis si simul febris accesserit, quemadmodum in nonnullis contigit, cum pulsu magno, qui utplurimum per decem circiter horas permansit, intumescere tunc inceperunt labia,

facies,

There is a large field for medical observations, during a very sickly season in the

facies lurida evasit; remittente dein febre sanguinem fuscum sat copiose vomitu rejecerunt, et hi fere omnes obierunt, et quidam paucis horis post hujus symptomatis apparitionem: nonnulli eandem materiam, sed nigriorem, tetrumque spargentem odorem, alvo excernebant, sed malum sanationem admisit; simile quid in quibusdam contigit, qui febre afficiebantur, licet dejectiones non urserint. Alios assueto modo inceffit biliosa febris et quantum vidère potui, hi maxime fuerunt juvenes, vel mediæ ætatis, robusti, et ante morbum alacres; cum ardore nempe circa præcordia, bilis vomitu, vel vomendi conatu, et siti fere inextinguibili; quidam horum in principio levibus frigoris, et caloris vicissitudinibus afficiebantur; dein subsequebatur urens in toto corpore calor, cum pulsu magno, pleno, et celeri; lingua fuit, subflava, albicans, sæpius limbo viridi in margine cincta, madida semper mansit.

Pergente morbo, in nonnullis secundo, in aliis tertio die, sponte, minuebatur calor, et pulsus naturalis ex improviso reddebatur, qui sensim sensimque minor evasit, et tandem parvus, et tremulus; apparentibus in nonnullis petechiis, imprimis circa pectus, brachia, et internam femorum partem, in nonnullis magnas lividas vidi maculas; hæc autem fiebant cum tanta virium prostratione, ut ægri minimo motu in animi deliquium caderent; sudor præterea copiosissimus in toto corpore suboriebatur; ægri insuper anxii, inquieti, leviter delirantes, admodum incuriosi, nihil æstimantes, nihilque querantes, evaserunt; attamen ad quæsita fere semper recte

the West Indies, when thousands of Europeans are sent thither at once, as during

recte responderunt. In nonnullis, decidente pulsu, suboriebatur ingens circa præcordia ardor, labia leviter intumescebant, facies evasit lurida, brevi post accedebat vomitus fuscæ materiei, et tandem mors: alii ardore, et alvi torminibus divexabantur atque tetrum subnigricantem sanguinem alvo ejecerunt. In nonnullis secundo, in aliis tertio vel quarto die, flavescere inceperent oculorum album, et cutis, quod mali fuit ominis. Lingua insuper de die in diem albidior, et tandem tremula evasit, semper in dorso jacuerunt ægri. Sic autem pergente morbo, nonnunquam secundo, vel tertio, sed utplurimum quarto die accedebat tranquilla mors. . . . . Sanguis, in calore febris vena emissus, læte rubebat, concrevit, serumque separavit, uti in Europa, subflavum; qui vero vi morbi restiterint, et quintum aut septimum diem attigerint, utplurimum furunculis vel pustulis parvis rubris dolentibus, admodum difficile in suppurationem abeuntibus, variolarum confluentium adinstar, fere in toto corpore tegebantur. . . . . . . Tandem maxima ægrotantium pars, imprimis, qui trigesimum prætergressi fuerunt annum, et quibus mali corporis habitus erat, dum morbo corripiebantur, conquesta est de dolore et ardore circa præcordia, cum vomendi conatu; sed pauci vomuerunt, pulsus in nonnullis per aliquot horas increvit, sed brevi iterum naturali similis factus est, et dein parvus: cutis calor naturalis fuit, lingua madida, et alba; copiosus sudor, primo jam morbi die, in toto corpore prorupit, nullæ tamen apparuerunt maculæ. Ii, quibus sudor parvus

ing war in that part of the world. The memorable deſtruction of admiral Hoſier's ſquadron, at the Baſtimentos, was begun by the ſcurvy, and completed by the malignant fever and flux. In the year 1741, no ſooner had the rainy ſeaſon ſet in at Carthagena, where the Engliſh troops lay

parvus aut nullus erat, copioſis nigris, et fœtidiſſimis dejectionibus, cum alvi torminibus vexabantur, inſuper lipothymiis quam frequentiſſime corripiebantur: ſi vero evacuationes hæ parum ceſſabant, aut notabiliter minuebantur, et ſudor copioſior non evaſit, tunc admodum angebantur ægri; hic autem ſi copioſius prorupit, longe melius ſe habuerunt: tandem in omnibus pertinaciſſime, ab initio ad finem uſque, permanſerunt vigiliæ. Juvenis 18 circiter annorum mane bene ſe habuit, verum circa horam decimam matutinam de capitis dolore et cæteris febricitantium ſymptomatibus conqueſtus, pulſum magnum, plenum, et celerem habuit, ſecundo die, ad veſperam, ſanguinem fuſcum vomitu copioſe ejecit: tertio autem obiit. Alius, 16 annos natus, veſperi bene ſe habuit, mane alterius die, in ſtrato ſenſuum expers inveniebatur; corpus examinavi, quod ſubtumidulum, maculis lividis conſperſum, pulſu fere in toto carens inveni; inſuper prodibat ipſa ſanguis ex aure ſiniſtra, naribuſque nigerrimus, guſtu ſubdulcis, qui aliquot horas poſt mortem fluere perrexit; cadaver vero brevi in integrum liveſcebat, et tetrum halitum emiſit.

Rouppe de Morb. Navigant. pag. 304, et ſeq.

encamped, than the same diseases appeared, and were remarkably malignant, became contagious, and destroyed the greatest part of the army; the poor remains of which were afterwards almost totally cut off, in the sickly season, upon the island of Cuba.

But as the Havannah is not quite so unhealthy as either Carthagena or Curaçoa, so in the expedition to that part of the world, in 1762, the diseases which harrassed the English troops, during the sickly season, though rendered very mortal, from want of good water and from other circumstances, were in general less violent and malignant than those which raged at Carthagena.

The following is an extract from a letter I received from a gentleman on that expedition, dated 24th of October 1762.

"I think myself extremely happy in "being among the number of the living, "considering the deplorable condition we "are now in. You will hardly believe "me, when I tell you, that I have only "33 men of my company now alive, out "of 100 when I landed. Our regiment "has lost 8 officers, and 500 men. They "mostly died of fluxes and intermitting

"fevers,

" fevers, the general diseases here. The
" other regiments have lost in proportion.
" We are now very sickly, as you may
" imagine, when out of 17 battalions here,
" we cannot muster 600 men fit for duty.
" The appearance of this country is most
" beautiful, and its natural advantages are
" many; yet a man's life in it is extremely
" uncertain, as many are in health one
" morning, and dead before the next."

END OF PART I.

PART II.

Advice to Europeans for the Preſervation of Health in hot Climates.

CHAP. I.

Advice for the Preſervation of Europeans reſident near the Sea.

SECT. I.

Signs of an unhealthy Country. Of the hot land-winds.

BEFORE giving directions for the preſervation of Europeans in unhealthy countries, it will be proper to enumerate the moſt certain ſigns, or proofs, of an unhealthy country.

The firſt proof of an unhealthy country, is a ſudden and great alteration in the air at ſunſet, from intolerable heat to a chill-

ing cold. This is perceived as ſoon as the ſun is ſet, and for the moſt part is accompanied with a very heavy dew. It ſhows an unhealthy, ſwampy ſoil, the nature of which is ſuch, that no ſooner the ſun-beams are withdrawn, than the vapour emitted from it renders the air raw, damp, and chilling, in the moſt ſultry climates; ſo that even under the equator, in ſome unhealthy places, the night air is cold to an European conſtitution.

The ſecond is, thick noiſome fogs, ariſing chiefly after ſun-ſet, from the vallies, and particularly from the mud, ſlime, or other impurities. In hot countries, the ſcent of theſe fogs may be compared to that of a new-cleaned ditch.——Diſeaſes therefore ariſing from this cauſe, generally take place in the night, or before ſun-riſing.

The third is, numerous ſwarms of flies, gnats, and other inſects, which attend ſtagnated air, and unhealthy places covered with wood.

The fourth is, when all butchers meat ſoon corrupts, and in a few hours becomes full of maggots; when metals are quickly

corroded,

corroded, on being expoſed to the open air; and when a corpſe becomes intolerably offenſive in leſs than ſix hours. Theſe are proofs of a cloſe, hot, and unwholeſome ſpot. In ſuch places, during exceſſive heats and great calms, it is not altogether uncommon, eſpecially for ſuch Europeans as are of a groſs habit of body, to be ſeized at once with the moſt alarming and fatal ſymptoms of what is called the yellow fever, without even any previous complaint of ſickneſs, or other ſymptoms of the diſeaſe. There has firſt been perceived an uneaſy itching ſenſation commonly in the legs, and upon pulling down the ſtockings, ſtreams of thin diſſolved blood followed; a ghaſtly yellow colour quickly diffuſed itſelf over the whole body; and the patient has been carried off in leſs than 48 hours.

The fifth is, a ſort of ſandy ſoil, commonly a ſmall, looſe, white ſand, ſuch as that at Penſacola, Whydah, and the iſland of Bonaviſta, which is found by experience to be injurious to health.

The peſtiferous vapour ariſing, during the ſummer months, in the heat of the

day, from ſuch a ſandy foil, is beſt characteriſed by its effects in the extenſive deſarts of Aſia and of Africa. It there conſtitutes what is called the ſamiel wind, a blaſt, which in the parched deſart proves inſtantly fatal both to man and beaſt; but when it paſſes over a ſoil covered with graſs and vegetables, has its effects greatly mitigated; it is however even then productive of ſickneſs: thus the ſoutherly winds, while they blow from the deſarts of Lybia, during the ſummer, at Algiers, Tunis, and Tripoli, produce an unhealthy ſeaſon. And at Madraſs, the winds, which in the months of April and May paſs over a large track of ſand, are always hot, diſagreeable, and unwholeſome.

During theſe land winds, ſudden guſts of a more hot and ſuffocating nature are often obſerved to come from thoſe ſands, once or twice, or even more frequently in a day, which ſeem to be this vapour in a purer form. Theſe guſts paſs very quickly, and affect perſons, who happen to be ſtanding with their faces towards them, in the ſame manner as the hot air which iſſues from a burning furnace, or from a

heated

heated oven, and obliges them immediately to turn from it, in order to recover breath. The effect of this hot ſuffocating blaſt or vapour on the human body, even when mitigated by paſſing through a moiſt atmoſphere, is the ſame as that of intenſe cold; it ſhuts up every pore of the ſkin, and entirely ſtops the perſpiration of ſuch as are expoſed to it. They come only in the day-time, and always from the deſarts.

Water is the only known antidote or corrector of this vapour: hence coarſe thick cloths, kept conſtantly wet, and hung up at the windows, or doors, greatly mitigate its violence. A houſe ſo built as to have no doors or windows fronting the deſarts, affords alſo an excellent protection againſt its pernicious effects. The hot land-winds conſtantly blow at Madraſs and other places on the coaſt of Coromandel, at that ſeaſon, from midnight till noon; the ſea-breezes then begin, which relieve the difficulty in breathing, and the obſtructed perſpiration which the former occaſioned.

That the heat of thoſe land-winds, as alſo of the ſudden guſts which accompany

them, proceed from large tracts of ſands being heated by the ſun, is evident, from the increaſed heat and ſuffocating quality of thoſe winds, in proportion as the day advances, and as the heat of the ſeaſon increaſes.

The oppoſite qualities of the winds, blowing from each ſide of the Balagate mountains, are a farther proof of this. Theſe mountains running from north to ſouth, divide the hither peninſula of India into two unequal parts, and ſeparate what is called the Malabar from the Coromandel coaſt. To the former they are very near, but at a great diſtance from the latter. The winds, blowing from theſe hills, are on the Malabar coaſt always remarkably cool; but on the coaſt of Coromandel, in the months of April, May, June, and July, are extremely hot and ſuffocating, as they paſs over a large tract of intermediate ſand, heated, during thoſe months, by an almoſt vertical ſun. Hence the Malabar coaſt is always cloathed with an agreeable verdure; whereas the Coromandel coaſt, during the continuance of thoſe hot winds, ſeems a barren wilderneſs, nothing appear-

ing green except the trees. On the contrary, the winds that paſs over thoſe ſands after being wet with the rains, are the coldeſt which blow at Madraſs.

Bottles of liquor, incloſed in bags of coarſe cloth, kept conſtantly wet, and ſuſpended in the ſhade, where thoſe hot winds may have free acceſs to them, become as cold as if they had been immerſed in a ſolution of nitre. This phænomenon has occaſioned much ſpeculation, and has been accounted a ſurpriſing effect; peculiar to theſe hot winds: but it is, in my opinion, owing merely to the conſtant evaporation of the water from the ſides of the bottle.

It is an obſervation of the natives on the coaſt of Coromandel, which is confirmed by the experience of many Europeans, that the longer the hot land-winds blow, the healthier are the enſuing months; theſe winds, as they expreſs it, purifying the air. Are not the winds, therefore, the cauſe why the air on the coaſt of Coromandel, except during their continuance, is more healthy than in other parts of India, where theſe winds do not blow? Does not this alſo ſuggeſt a very probable reaſon, why the

plague

plague in Egypt generally ceaſes in the beginning of June? The periodical hot winds, which come from the deſarts of Nubia and Ethiopia, having then rendered the air of Egypt pure and wholeſome. Many have aſcribed that effect to the north winds, as the plague not only ceaſes when they blow, but all infected goods, houſehold furniture, and wearing apparel, are then ſaid to become entirely free from the contagion; theſe, however, cannot be the cauſe, as the moſt deſtructive plague is abated in its violence, if not wholly eradicated, before they ſet in. With equal propriety we may reject the opinion, that the overflowing of the Nile is productive of that ſalutary effect, as the plague generally ceaſes before the increaſe of that river is perceptible.

Thus the plague, the greateſt calamity which can afflict mankind, ſeems to be deſtroyed by thoſe hot winds, which are otherwiſe ſo pernicious to animal and vegetable life. And although, during the continuance of theſe winds, the moſt fruitful fields wear the aſpect of a parched deſart, yet no ſooner the rains fall, but vegetation is reſtored, the plants revive, and a beauti-

ful

ful verdure is again ſpread over the face of the refreſhed country. In Egypt, where it ſeldom rains, the ſame effect is produced by the overflowing of the waters of the Nile.

SECT. II.

Employments which prove moſt fatal to Europeans, in hot and unwholeſome Climates.

IT will next be proper for the benefit of thoſe who only viſit, but do not mean to reſide in foreign climates, to point out ſome employments, which are of ſuch a nature, as cannot well be performed in hot and unhealthy countries by Europeans, eſpecially by ſuch as are lately arrived, without imminent danger of their health and lives.

The firſt is that of cutting down woods, or clearing the ground from trees, ſhrubs,

&c. I could produce many instances of the fatality of this employment, but shall here mention only two.

At the conclusion of the late peace, the captain of a ship of war went on shore at the island of Dominica, with twelve of his men, to cut down the wood, and clear a piece of ground, which he intended to have purchased; but in a few days, sickness obliged him to desist from this dangerous work, the captain and eleven of his men being seized with violent fevers, which terminated in obstinate intermittents, and of which several died. The survivors suffered so much in their constitutions, that even after they came to England, the return of an east wind was apt to bring on a violent fit of the ague. The Ludlow-castle, a ship of war of 40 guns, in a late voyage to the coast of Guinea, also lost 25 of her men at Sierra Leon, who were employed in cutting wood for the ship.

This is an occupation which has often proved destructive to Europeans in those climates, and in which they ought never to be employed, especially during the rainy season. There are numberless instances of

white

white persons, when cutting down the woods at that season, who have been taken ill in the morning, and dead before night. The extreme danger of this work at such a time, would even render it a proper punishment for such convicts as were saved from the gallows for this purpose. If the purchasing of negroes on the coast of Guinea can be justified, it must be from the absolute necessity of employing them in such services as this is. It does not seem consistent with British humanity to assign such employments to a regiment of gallant soldiers, or to a company of brave seamen.

Another evil, less known and less suspected, but no less dangerous, is the sending of Europeans in open boats, after sunset, where the soil is swampy, or where there are great night fogs.

The duty alone of fetching fresh-killed butchers meat at night, for the use of our ships companies, in the East and West Indies, has destroyed every year several hundred seamen. In those parts of the world, butchers meat must be brought on board at night, immediately after it is killed, otherwise

otherwiſe it will not be fit for uſe the next day: but ſurely a contract for ſending it on board at that ſeaſon, might be made with the natives, for a trifling ſum of money; and it ought to be conſidered, that this trifling ſum is advanced for the preſervation of many lives.

During the ſickly ſeaſon at Batavia, a boat belonging to the Medway, which attended on ſhore every night, was three times ſucceſſively manned, not one having ſurvived that ſervice. They were all taken ill in the night, when on ſhore, or when returning on board; ſo that the officers were at length obliged to employ none but the natives of the country on that buſineſs.

Great numbers of men have periſhed, from being employed in this manner at Bengal, where the European ſhips often anchor, in the moſt unhealthy parts of the river; and even when the great night fogs ariſe, after the rainy ſeaſon, the men are often obliged to perform ſuch night ſervices in boats.

Now, ſince it is ſo dangerous for Europeans in unhealthy countries, particularly during a ſeaſon of ſickneſs, to be expoſed in an open boat to the foggy night air; it

muſt appear that ſending them unſheltered, in open boats, far up rivers, in unhealthy ſouthern climates, for the ſake of wood, water, trade, or other purpoſes, muſt be attended with the moſt deſtructive and fatal conſequences.

The beſt preſervative againſt the miſchievous impreſſions of a putrid fog, or of a marſhy exhalation, is a cloſe, ſheltered, and covered place; ſuch as the lower apartments in a ſhip, or a houſe in which there are no doors or windows facing the ſwamps. If, in ſuch places, a fire be kept, either in the chambers or at the doors and other inlets to a houſe, as is practiſed in ſome unhealthy countries, during their rainy or noiſome foggy ſeaſon, it will prove an excellent and effectual protection againſt the injuries of a bad air; on board of ſhips, fires may alſo be made at the hatchways. Of many examples which might be offered to prove this, I ſhall only give one.

When the Edgar, a ſhip of war of 60 guns, was upon the coaſt of Guinea, in the year 1765, her men were very ſickly, and many of them died: whereas it was obſerved, that in a ſloop of war, which was conſtantly

in company with her, few were taken ill, and not one died during the whole voyage. This could be afcribed to no other caufe, but that in the floop the fire-place for cooking victuals was on the fame level with the deck, upon which the men lay; and every morning, when the fire was lighted, efpecially when three was but little wind, the fmoke from the cook-room fpread itfelf over the fhip, particularly over thofe parts where the men lay; but from the conftruction of the fire-place in the Edgar, no fmoke from it ever came between her decks.

Perfons on board any fhip whatever, are much fafer than thofe who make diftant inland incurfions in fmall boats upon the rivers, in unhealthy tropical countries. Thefe are alfo for the moft part totally ignorant of the fources of the difeafes and deaths which furround them. The intolerable fcorching heat at noon often obliges fuch perfons to go half naked, their clothing being almoft infupportable; while a free and plentiful perfpiration iffues from every pore. In the daytime, the fwampy fhores emit a fmell refembling that of putrid carrion; and a near approach to fuch putrid fwamps is then apt

to produce an immediate ſickneſs, a vomiting, and afterwards a low, nervous fever*. But if they happen to paſs them at night, or lie near them in an open boat, the air from thoſe ſwamps is perceived to be quite chill and cold; inſomuch that warm, thick clothing becomes abſolutely requiſite, to guard the body againſt the impreſſions of ſo great an alteration in the air, and of its cold and inclement quality. The ſmell of the ſwamps, and the vapour ariſing from them, at this time, reſembles the unwholeſome ſcent of a ditch lately cleaned: and the effect upon the moſt healthy and vigorous conſtitution, is often a chilling cold fit of an ague,

* In ſuch circumſtances, a vomit taken immediately, and a change into a pure air, will often prevent a fit of ſickneſs.

A company of gentlemen belonging to his Majeſty's ſhip the Phœnix, taking the diverſion of hunting and ſhooting at the mouth of the river Gambia, by following their game into a large ſwamp, were all of them taken ill. They were immediately ſeized with a ſickneſs, vomiting, head-ach, and a conſtant hawking and ſpitting, from the diſagreeable ſmell which (as they expreſſed it) ſeemed to remain in their mouth and throat. Upon returning to the ſhip, each of them was ordered a vomit, which immediately removed all their complaints.

 terminating

terminating in a fever, with delirium, bilious vomitings, a flux, or even death itſelf.

I hope, what has been ſaid on this ſubject, will ſerve to excite ſome tender feelings of humanity in ſuch as have the direction of our trade and ſhips abroad; as nothing can be more inhumane than ſending unſeaſoned Europeans high up, from the mouths of rivers, into an uncultivated country, eſpecially during the rainy ſeaſon, and where there is no ſhelter from the peſtiferous night air *. This practice

* It may be here expected, that where ſuch duties are unavoidable, thoſe who undertake them ought to be furniſhed with ſome precepts for their preſervation.

I would adviſe all who are employed in cutting down woods, or in other laborious and dangerous ſervices in hot climates, during the heat of the day to have their head covered with a bladder dipt in vinegar, and to waſh their mouths often with vinegar; never to ſwallow their ſpittle, but rather to chew a little rhubarb, or ſome other bitter, and ſpit it out frequently; to ſtop their noſtrils with a ſmall piece of linen or tow, dipped in camphorated vinegar; and to infuſe ſome bark, garlic, and rhubarb in brandy, of which a dram is to be taken either by itſelf, or diluted with water, morning and evening.

In the evening, before ſun ſet, they ſhould leave off work, and not return to their labour in the morning, till the ſun has diſperſed the unwholeſome dews and vapours.

practice is the more inexcuſable, as the points gained by it may generally be accompliſhed by other means.

If it be done for the ſake of wood, water, or other neceſſaries of life, there are few places in the world where theſe cannot be

vapours. For their ſafety during the night, they ſhould retire to a cloſe hut, as the dews may penetrate a tent; here, in the abſence of the ſun, a conſtant fire ſhould be kept; or if that be found impracticable, the apartment in which they lie ſhould be well fumigated with gunpowder, as fire and ſmoke will afford them the moſt excellent defence againſt the noxious and dangerous qualities of the night-air. The ſmoking of tobacco in their huts, and chewing of garlic, and not ſleeping on the ground, are circumſtances which will alſo contribute to their preſervation.

If, from a neglect of theſe precautions, the nocturnal chill fog has made an impreſſion upon the body, a vomit ſhould immediately be adminiſtered near a good fire, and a plentiful ſweat excited after it, which will often prevent fatal conſequences. If any ſymptoms of a low fever ſtill continue, as a head-ach, a ſickneſs at the ſtomach, chills, &c. a bliſter ought immediately to be applied, as theſe complaints, though ſeemingly ſo ſlight as not to confine the patient to his bed, are deceitful, and often terminate in a fatal malignant fever. If this fever can be brought to intermit, let the bark be immediately taken, to the quantity of a quarter of an ounce, or more, in red wine, every two hours, and the patient quickly removed into a better air.

brought into a fort, factory, or ship, by the natives, and persons perfectly seasoned to the country.

If it be done for the sake of trade, might not this be effected with equal advantage, by having the trading boats or vessels managed by the natives; who are generally much better acquainted with the navigation of the rivers in their own country than strangers are?—And in this case, an honest native factor, or at least one or two white people long seasoned to the climate, will be sufficient to superintend the cargo.

Upon the whole, if all ships of war and others, bound to the East and West Indies, were permitted, on their arrival in those parts of the world, to enter, as part of their complement, from 10 to 20 blacks or natives, to be solely employed in such duties as have been mentioned, it would undoubtedly be a means of saving the lives of many Europeans. Such may be entered on board as are fishermen by profession, or who are dextrous in the management of small vessels and boats. Thus, for example, at Jamaica, the proprietors would willingly permit the slaves to serve on board the king's ships, in the

West-

Weſt Indies, for any length of time, provided their wages were paid to their maſters. And thoſe negroes being deprived of the means of debauchery and riot, which our ſeamen when on ſhore are apt to fall into, the duties of wooding and watering the ſhip, and all the ſervices required of boats at night, would, in all probability, be more ſpeedily and faithfully executed.

Burying the dead in ſwampy countries, is another occupation which has proved fatal to many, and which ought alſo to be entruſted to negroes, or the natives of the country. The effluvia from ground newly opened, whether from graves or ditches, are far more dangerous than from the ſame ſwampy ſoil when the ſurface is undiſturbed; nay, in ſome places, it has been found to be almoſt certain death for an European to dig a grave, unleſs long ſeaſoned to the country. In ſuch a place, the attendance of friends at funerals ought to be diſpenſed with.

I am ſenſible that it is not uncommon to meet with gentlemen who have been long in the Eaſt and Weſt Indies, who treat all the apprehenſions of ſickneſs in thoſe climates as imaginary, and the precautions

againſt them as needleſs and chimerical. It is probable they might never have been employed in ſuch ſervices as I have mentioned, or have not reſided much, during the ſickly ſeaſons, in very unhealthy places. If notwithſtanding theſe they have been ſo fortunate as to enjoy good health, which many have done, when well ſeaſoned to ſuch climates, I will addreſs them in the words of Cicero to his friend at Baiæ, which delicious winter retreat of the ancient Romans was remarkable then, but is much more ſo at preſent, for its unwholeſome air during three months in the ſummer. "Gratulor "Baiis noſtris: ſiquidem ut ſcribis ſalubres, "repente factæ ſunt: niſi forte te amant, et "tibi aſſentiuntur, et tamdiu, dum tu ades, "ſint oblitæ ſui. Quod quidem ſi ita eſt, "minime miror, cœlum etiam et terras vim "ſuam, ſi tibi ita conveniat, dimittere."

It is not the intention of this treatiſe to diſturb ſuch favourable opinions as theſe, which it is proper ſhould be entertained by all thoſe, whoſe ſtation in life requires obedience, without ſpeculation. But a total ignorance of theſe important matters, or inattention to them, is in commanders in

chief,

chief, highly blameable, as well as extremely dangerous, ſince the lives of thouſands may be loſt by it.

SECT. III.

The Diſeaſes incident to ſtrangers ſimilar in different climates; occur at particular ſeaſons; are confined to particular ſituations. The conſtitution of Europeans ſeaſoned by time to hot climates. A removal during the ſickly ſeaſon recommended.

THE obſervations, which we have made concerning the reſpective ſalubrity of the different climates, in the four grand diviſions of the world, point out thoſe diſeaſes which are moſt fatal to Europeans, in different countries; the ſituations have been ſhewn, in which they moſt generally occur, and the employments in which Europeans are moſt expoſed to them. It now remains to deduce ſome uſeful concluſions from thence, for the benefit of ſuch Europeans as ſettle in hot climates.

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The firſt is, That the diſeaſes of ſtrangers in different climates bear every where a great ſimilitude to each other; that the violence or malignity of the fevers and fluxes, to which they are ſubject, depend, in a great meaſure, upon the degrees of heat and moiſture; and that they are particularly influenced by the nature of the ſoil and of the winds.

Secondly, There is ſcarcely any country, however unhealthy, that has not its healthy and pleaſant ſeaſons. Theſe laſt continue for the greateſt part of the year, and at ſuch times, it may with ſafety be viſited by ſtrangers.

Thirdly, The moſt unhealthy ſpots in the world have in their neighbourhood, and often at no great diſtance from them, places which afford a ſecure retreat from ſickneſs. This has already appeared in part, and will be more fully proved in the ſequel.—In a word, the diſeaſes moſt fatal to ſtrangers in every country, ſeem not only to be confined to particular ſeaſons, but, even during thoſe ſeaſons, to certain places only.

Fourthly, By length of time, the conſtitution of Europeans becomes ſeaſoned to the

East and West Indian climates, if it is not injured, by the repeated attacks of sickness, upon their first arrival. Europeans, when thus habituated, are generally subject to as few diseases abroad, as those who reside at home; insomuch that many persons, dreading what they may be again exposed to suffer from a change of climate, choose rather to spend the remainder of their lives abroad, than to return to their native country.

These positions are very interesting to all who go abroad; and they lead us to the important object of this treatise, the preserving annually a multitude of lives, as they point clearly out to us the easiest and the most effectual method for accomplishing that great purpose.

Strangers should always leave unhealthy spots, for a few months during the sickly season, until they become well inured to the climate.

This removal to a small distance from the seat of sickness, promises a security at least equally certain with the method now taken by Europeans, of shutting themselves up in their houses, and having no communication with the natives, during the rage of the

plague

plague in Turkey. It is likewiſe a precaution, upon which the ſafety of ſtrangers, in unhealthy climates, may ſometimes alone depend.

One cannot, without aſtoniſhment, reflect on the blindneſs of mankind, in never diſcovering this ſo ſimple and eaſy a method, which their own obſervation muſt have every day pointed out to them: yet our factories abroad have never paid any attention to it, and a proper method of doing it has never been recommended to them.

SECT. IV.

A convenient and ſafe retreat from ſickneſs pointed out.

IT may, at firſt ſight, appear almoſt impracticable to find a convenient and ſafe retreat from the ſickneſs, which rages at times in many foreign climates. Mankind are more ready to ſtart difficulties on this ſubject, than deſirous to remedy them. Some will be ready to aſk, for inſtance, Where can

that safe retreat be found, on the coast of Guinea, in the rainy season, when the whole country is almost covered with water?

The proper answer to this question is, That all places on that coast are not equally unhealthy. The English found the island of Goree much more healthy than their settlements either on the rivers Senegal or Gambia, and there fewer people died in proportion, than in the adjacent parts of Africa. We shall see from the following circumstance, that retreats of safety may be found even upon that coast.

The Portuguese, finding that almost all the European missionaries, whom they sent to propagate the Christian faith in Guinea, died soon after their arrival, found it necessary to establish a seminary of learning at St. Jago, for the instruction of black priests. But as their laws do not permit those of the black colour, to rise to the dignity of a bishop, the see of St. Jago was always filled by a person of this order sent from Lisbon. The lives of the bishops at St. Jago were generally so short, that whoever was appointed bishop to the Cape de Verd islands, considered himself as offered a sacrifice to the climate;

mate; till ſome years ſince, a ſenſible prelate, dreading the fate of his predeceſſors, procured a diſpenſation of abſence from his cathedral, and was permitted to live in the iſland of St. Antonio. In conſequence of this diſpenſation, the European biſhops now live in this iſland, at a ſmall diſtance from their cathedral, to as great an age, and in as good health, as if they had continued at Liſbon.

It is beyond a doubt, that on many other places of that coaſt, there are dry, elevated, and well ventilated ſpots, which, by being thoroughly cleared of wood, might be rendered healthy to European conſtitutions. We ſhall only mention the high hills of Sierra Leon, upon whoſe ſummits the air is clear and ſerene, while thick miſts and noiſome vapours overſpread the lower grounds: yet even at this place the Engliſh inhabit a low valley, merely for the benefit of a ſpring of good water; the carriage of which, to any part of that hill, might be eaſily performed by ſlaves.

It is aſtoniſhing to obſerve, that, while one third of the Europeans die annually in many of the factories, from their unhealthy ſituation,

ſituation, their negroes are permitted to lie idle or aſleep the greateſt part of the day, who might be uſefully employed in clearing the ground around them, draining the ſwamps, and by burning or cutting down the woods, in opening avenues through them, for purifying the air.

The mortality of thoſe Europeans muſt not therefore be attributed ſo much to the malignity of the climate, as to their own inattention. A foreigner who fixes his abode upon a ſickly ſpot in England, as for example at Hilſea * Barracks, in the iſland of Portſea, muſt not reckon the climate of Great Britain unhealthy, becauſe he ſuffers from being placed on ſo bad a ſituation.

In ſultry climates, the ſmalleſt errors of this kind are attended with much more fatal conſequences than in our northern latitudes.—The Engliſh caſtle at Whydaw has been rendered more unhealthy than the negroe town in its neighbourhood, by a ſmall circumſtance, unattended to at firſt. It is built on a ſpot of ground that the ſea-breezes

* Barracks well known to moſt of the officers in the army, for the prevalence of obſtinate autumnal diſeaſes, which frequently are confined to them alone.

cannot

cannot reach, without paffing over a little inconfiderable brook, which produces fome aquatic plants, always covered with an offenfive flime.

During the prefent uncultivated ftate of Guinea, it is not probable that the Europeans will form any confiderable inland fettlements; their chief factories are fituated near the fea: thofe therefore who refide in them can fcarcely have any where a better and more excellent retreat, in the fickly feafon, than on that healthy element*. It will occur to the reflection of all who have vifited fuch places, that the fea-breezes bring always health and a pleafant fenfation along with them.

It was obferved, that during the fummer and autumn 1765, when fevers raged at Portfmouth, and in fuch fhips as lay in that harbour near the mud, the men who were in the fhips at Spithead enjoyed perfect health. For three months, when this epi-

* In my other works I have given feveral inftances, which clearly prove, that the fea air affords a certain afylum from ficknefs in all hot and unhealthy countries. See my Effay on preferving Seamen, chap. I. fect. VI. and my Differtations on Fevers, chap. I. fect. IV.

demical

demical ſickneſs prevailed moſt, there was not one ſeaman or marine ſent to Haſlar hoſpital, who had been ſeized with it, in any ſhip at Spithead.

When the violent and fatal ſickneſs raged at Cadiz, it did not extend its influence to any ſhip which lay at a diſtance from the city; as I am informed by Dr. Maguire, an eminent phyſician of that place. His Majeſty's ſhip the Tweed was then at anchor in Cadiz bay: an officor and ſeveral of her men, who had been on ſhore, were ſeized with this fever; but all thoſe who were ſent on board the ſhips recovered, no bad ſymptoms appearing in their fever; whilſt a diſeaſe, ſimilar to the black vomit and the yellow fever, and equally mortal, depopulated that large city.

When admiral Broderick's ſquadron lay at anchor, off the iſland of Sardinia, as I before obſerved, it continued in perfect ſafety from thoſe fatal diſeaſes which ſeized almoſt all his men, who ſlept on ſhore.

Lately, when a mortal ſickneſs, in the year 1765, prevailed at Penſacola, by which a regiment newly arrived there loſt 120 men, and eleven out of twelve of the officers ladies

who were landed with them, were ſaid to have died; the companies of the men of war, lying at a mile's diſtance from the ſhore, enjoyed the moſt perfect health. Theſe ſhips were the Tartar and Prince Edward, of whoſe men, thoſe only who had been on ſhore were ſeized with this malignant fever, and all of them recovered when they got on board. It was likewiſe remarkable, that ſuch gentlemen as were ſeized with this fever at Penſacola, and carried on board ſhips, quickly recovered; or at leaſt, by this change of air, the fever, being diveſted of its moſt mortal ſymptoms, ſoon aſſumed the form of an intermittent.

From what has been ſaid, we are not to infer, that ſuch as live in ſhips are always exempted from the diſeaſes of the adjacent country: the reverſe of this is often felt by our ſeamen, who ſometimes from accidents unavoidable, and often from an ignorance almoſt unpardonable, ſuffer more dangerous ſickneſs than even many who live on ſhore. Thus lying either near ſwampy grounds, or in cloſe unventilated harbours, is equally dangerous with being on the land itſelf.

I am informed by Mr. Martin, ſurgeon

of the Cataneuch, a Guinea trader, that when he was in Gambia river, in company with four other ships, the men, in one of those ships, were daily taken ill of fevers and fluxes, and several of them died delirious; while all the English in the other ships, and in the factories, were in perfect health: but upon removing that ship about half a league from her first anchorage, which was too near some swamps, her men became as healthy as those in the other ships.

SECT. V.

Ships recommended to be used as floating Factories.

THE just inference, from what has been said, is, that if a ship was fitted up as a floating factory, and secured at a due distance from the shore, at the mouths of the rivers Senegal and Gambia, at Cape Coast, and all other places where it may be found necessary and safe, it would be a means

of preſerving every year a multitude of lives, eſpecially on the Guinea coaſt.

The idea of a floating factory is not new to thoſe who have been in Guinea: ſhips ſo called, have been ſecurely moored on different parts of that coaſt, for the advantage of trade. But they are here propoſed for the benefit of health, without which there is very little comfort, even in the advantages of commerce.

Such as have only ſeen merchants ſhips or coaſting veſſels, and are unacquainted with the many conveniences, which may be made in a ſhip, for the accommodation and entertainment of people of the higheſt rank, and of the moſt exquiſite taſte in luxury, will think it ridiculous to adviſe governors and principal merchants to ſleep, or live, for three or four months in the year, on board a ſhip.

But we muſt not confound our idea of people, pent up in a ſmall ſhip, or in a veſſel at ſea, undergoing all manner of hardſhips, ſuffering extreme hunger, inceſſant fatigue, and frequent diſappointments, with the ſituation of perſons living at eaſe, in a commodious ſhip, and furniſhed with all ſorts of neceſ-

neceſſaries by means of a daily intercourſe with the country.

The admirals of our fleet, and captains of our ſhips of war, find in few places abroad, better entertainment, or more convenience, than in their own ſhips. In like manner, a floating factory may be fitted up, in any taſte whatever, either for convenience or pleaſure.

Mr. Doidge, late, ſecretary to admiral Watſon in the Eaſt Indies, upon his return home, being in an ill ſtate of health, and having always found himſelf better when on the water, contrived a veſſel of a commodious form, to which he gave the name of the Ark, in which he had reſolved to ſpend much of his time. This little floating houſe contained a wine and coal cellar, a kitchen, a dining-room, and a ſleeping room, elegantly furniſhed, and an apartment for his ſervants. In this floating manſion he propoſed to reſide during the heat of the ſummer, as a pleaſant and cool retreat, for the benefit of his own health, as well as for the entertainment of his friends.

If, in addition to the many conveniencies which a ſhip, properly fitted up, would

afford to the gentlemen in any factory, we consider health and preservation of life as principal objects of their attention, the propriety of establishing such floating factories, where it may be found necessary and safe, can scarcely be questioned. There is good anchorage off the bars, both of Senegal and Gambia, in the road of Sierra Leon, and in many other places of the coast, where ships with masts ride safely, at all seasons of the year: in how much greater safety must a ship at anchor then be, which has no masts? Shipwrecks are uncommon on this coast, as the most violent storms, the tornadoes, come always from the land, and are of short duration.

Those ships are proposed as a retreat from sickness during the rainy season, and for a few weeks after it, until health be restored to the country. They will also afford a pleasant retreat into a pure air, which will establish health of body, and chearfulness of mind, at a time when thick fogs and heavy rains render the houses on shore damp and uncomfortable.

The sickness which might attack, at this season, any of the gentlemen on board the

vessel, would be slight: it would probably be no more than a gentle diarrhœa, or a bilious complaint, which could be easily removed. In addition to those directions, which I gave on a former occasion, for preserving a constant purity of air in ships *, they should keep a fire, especially during the night, between them and the land effluvia, which would be extremely conducive to health. This might be easily done in a country where labour and fuel † are of small value: besides, the fire might be employed in distilling fresh water from the sea; so that, by this means, they might have the air purified, and at the same time be supplied with the most wholesome drink.

The vulgar and erroneous opinion of the sea air being the cause of scorbutic and of other violent disorders, to which seamen in long voyages are subject, I have already

* See Essay on preserving Seamen.

† In order to avoid insects, let the wood or fuel brought from the shore remain in a boat until it is used; it commonly abounds with noxious vermin, and therefore ought never to be placed in any close confined part of the ship; it may be put with other lumber, in a small tender, moored near the floating factory.

confuted in my Treatiſe on the Scurvy, and in my Diſſertation on Fevers and Infection.

Notwithſtanding the uſe of a floating factory, it may be alſo neceſſary to attend to ſome directions, which I have given in the Eſſay on preſerving Seamen, for preventing ſickneſs in thoſe climates; perſons ſhould refrain from intemperance and exceſſes of every kind. We do not recommend them to uſe any medical regimen, but to obſerve an habitual regularity.

As a proof of what may be done, by a proper attention to thoſe directions, in the moſt ſickly ſeaſons and climates, I ſhall ſubjoin the following particulars, communicated to me by Mr. Boon, who reſided for three years at Senegal, as ſurgeon general to the troops.

Mr. Boon being furniſhed with a copy of my Eſſay on preſerving Seamen, he and ſeveral of the officers followed the directions therein contained. Governor Worge, Mr. Boon, and others, drank every morning for breakfaſt, by way of tea, an infuſion of the bark, or of ſome other bitter ingredient, ſuch as chamomile, gentian, orange-peel, or the like, in warm water.

Some-

Sometimes they mixed with their tea a ſmall quantity of the tincture of the bark. They drank theſe bitters morning and evening, and took a gentle doſe of manna, with purging ſalts, once or twice a week. They were abſtemious in the article of food, and were particularly careful not to drink wine or ſpirits to exceſs: by which means their ſtomachs and bowels were preſerved in ſuch a ſtate, as greatly reſiſted the attack of thoſe bilious fevers, fluxes, and other diſorders, which raged there, with deſtructive violence, during the ſickly ſeaſon. Experience had ſo fully convinced them of the efficacy of thoſe means, that the uſe of them became general; and when their ſtock of bark was exhauſted, the moſt common bitter herbs, or roots, ſold at an extravagant price. Much about this time, a ſhip from New York arrived at Senegal, which had on board ſome bark, and a quantity of gentian-root, orange-peel, and common wormwood, together with ſome bottles of Stoughton's drops. Theſe bitters became a valuable cargo for the proprietor, and were bought up, at a high price, by the governor and others, who could afford to purchaſe them.

SECT.

SECT. VI.

An immediate change of air recommended on the attack of fevers.

WE proceed to offer one Direction farther, for the benefit of thoſe who have either neglected the directions already given, or who, from various circumſtances, could not put them in practice: there may be many whoſe indiſpenſible buſineſs requires their conſtant reſidence in unhealthy places aſhore, and who muſt therefore be expoſed to the violent attacks of ſickneſs.

The preſervation of all ſuch perſons as remain in unhealthy places during the ſickly ſeaſon, will in a great meaſure depend upon an immediate change of air, as ſoon as they are ſeized with the prevailing ſickneſs of the country.

I acknowledge it to be new, to propoſe the immediate removal of a perſon labouring under a violent fever, to ſome diſtant place, let the ſymptoms be what they will. It may be objected, that the gentleſt motion will, in many ſuch caſes, affect the head

and

and bring on a delirium, or increaſe the ſymptoms of the diſeaſe; that as uninterrupted reſt and quiet appear neceſſary to the welfare of ſuch patients, the hurry of motion, and even the diſturbance produced by taking them out of bed, but eſpecially the expoſing of them to the open air, muſt be highly injurious.

The experience of many years in theſe matters has convinced me, that ſuch apprehenſions of danger are entirely groundleſs. I have had the moſt ample means of aſcertaining, that perſons labouring under fevers, fluxes, and other diſeaſes, may with great ſafety be moved from one place to another; nay more, that by a removal of them, with proper care, from a bad into a pure air, ſuch patients receive immediate benefit. Of many thouſand patients labouring under fevers, whom I have viſited in Haſlar Hoſpital, for twenty-five years, nine tenths of them were moved during the continuance of their fever, either from Spithead, from the ſhips in the harbour, or from the Marine infirmary at Portſmouth: they were brought in boats, or otherwiſe, to the hoſpital; and I do not remember that

any

any patient was ever injured by ſuch removal; on the contrary, I am perſuaded that many hundreds, under the moſt dangerous and malignant ſymptoms of the diſeaſe, have received great benefit by the removal from the foul air of their ſhips into the pure air of the hoſpital.

The firſt ſtep to be taken for the preſervation of ſuch Europeans as are taken ill on ſhore, during the rage of an epidemic ſickneſs, is to remove them immediately, as far as poſſible from the original, and perhaps the only ſource of their ſickneſs; that is, from the land into the ſea air. The ſituation of ſuch a perſon, while expoſed to the influence of the ſame bad air which produced his ſickneſs, is ſimilar to that of a perſon in a contagious fever, who is conſtantly expoſed to a freſh ſource of infection. The following relation therefore is not unapplicable to our preſent ſubject. I was once deſired to viſit an alms-houſe, in which a low malignant fever prevailed, that had proved fatal to ſeveral of the poor people. This fever was evidently contagious, and the apothecary informed me, that he had treated it in the moſt approved way, and with

ſuch

fuch remedies as are prefcribed by writers of character, without being able to ftop the progrefs of the difeafe, or its mortality. Upon entering into this houfe, I perceived two or three dead bodies lying in the fame chamber with the fick. Upon the beds of fuch as had died, new patients were laid, and the chambers abounded fo much with ftench and filth, that, without afking the fick any queftions, or inquiring farther into their cafes, I gave it as my opinion, that as long as the dirt and naftinefs of the place continued, they would prove fuch a conftant fource of infection, that the prefcription of the moft efficacious medicines would have little or no effect. This I found the apothecary had repeatedly, but unfuccefsfully, reprefented to the overfeers. His reprefentations however were now complied with, and the fever quickly difappeared.

In like manner, when a perfon is feized with a fever, proceeding from the bad air of a country, his illnefs, while he continues there, is daily, nay hourly, ftrengthened and reinforced, by a conftant application, or as it were inoculation, of the morbid caufe.

caufe. We are taught by fatal experience, that the moft fovereign remedies, and the beft methods of cure that can be propofed for the relief of fuch perfons, while they breathe an unhealthy air, are generally ineffectual. Difeafes in fuch a fituation generally become more anomalous, and are both attended and followed by fymptoms, which feldom appear in a purer air. From this caufe, fome of the beft remedies have been blamed, notwithftanding they produced all the effects which could poffibly be expected from them, whilft the patient continued expofed to thefe fources of difeafe. This calumny has chiefly fallen upon the bark.

In the late fiege of the Havannah, while the Englifh troops fuffered fo much by the difeafes incident to Europeans in thofe climates, the adminiftration of the bark was blamed, becaufe, after the fever had been removed by its efficacy, the patients were apt to be afflicted with the jaundice, the dropfy, or a fwelling and obftruction in the liver.—But fuch difeafes were much lefs dangerous and fatal than the fever, and were not the effects of the bark, but of the pa-

tient's

tient's continuing in an impure air, and of the duration of the fever *.

SECT. VII.

Effects of a bad Air on persons in health; its effects on such as are sick; consequences of removing the sick in fevers, from a bad into a good air. How long the effects of bad air lie concealed in the body; how far the fever thence produced is contagious.

IN order further to evince the propriety of an immediate removal of the sick in fevers, upon the first attack of the disease, we shall point out first the effects of bad air on persons in health, then its effects on such as are sick, and, lastly, the consequences of removing persons immediately when taken ill in such an air into a place where that element is more pure and wholesome.

* See a full proof of this in the Appendix.

First,

First, we are to consider the effects of the unwholesome air in hot countries, during the rainy seasons, on the human body when in health. Here it is remarkable, that the breast and lungs, as also the throat, through which the air in respiration passes, are generally the parts of the body which suffer the least, though in constant and immediate contact with it. The parts chiefly affected by it are the brain and stomach; or, in other words, the nervous system and the organs of alimentary digestion.

A phrenzy or delirium is often the first and immediate effect of a bad air. Young people in particular, are apt to have their head much disordered, and to be stupid or slightly delirious at times. Persons unaccustomed to such an air, though seemingly in health, feel an oppression and lowness of spirits; they become inactive, have a great inclination to rest or sleep, and often complain of a head-ach; their reasoning faculties are sensibly impaired, and particularly their memory. Every kind of study, or long attention of the mind to any subject, as likewise venery, are hurtful, and frequently attended with fatal consequences.

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The passions of the mind have here a much quicker and more violent effect on the body, than in a purer and cooler air. An excess of passion often brings on an instantaneous attack of a fever; a violent fit of anger, or grief, will immediately produce a jaundice, or the yellow fever; the sight of a corpse or any object of horror, and even a shocking story told to a person, have been often known, through an impression of fear upon the mind, to bring on a delirium, in one who was before in perfect health, and have sometimes occasioned a violent vomiting and purging, which have carried off the patient in twenty-four hours.

A bad air has also a great influence on the stomach and intestines: it generally occasions a loathing and indigestion, and an aversion to much food; together with frequent bilious stools, which ferment like yeast. Those who seem to be otherwise in good health, become of a yellow complexion. Excesses, either in eating or drinking, prove much more pernicious to the constitution than in a purer air. A surfeit of fruit, or of gross food, but especially undue mixtures in the stomach, such as of flesh,

fiſh, and fruits, taken at one meal, will often produce a violent dyſentery, or a fatal cholera morbus. Drunkenneſs or any debauch will often give a fever, which, in leſs than forty-eight hours, terminates in the death of the patient.

It is alſo always a proof of a bad air, when wounds, which are nearly healed, break out ſuddenly afreſh, attended with great putrefaction of the parts. This happens both from the unwholeſome air of marſhes or impure ditches, and from the hot ſuffocating winds, which blow from the deſarts.

Theſe are the effects on vigorous and healthy conſtitutions of that noxious air, which is often breathed by Europeans in many unhealthy parts of the world; it will be proper next to obſerve its influence on the ſick. For this purpoſe, we ſhall relate the effects of the unwholeſome air from marſhes in the climate of Jamaica.

At Jamaica a commodious hoſpital was erected for the reception of the ſick ſeamen in his Majeſty's ſhips on that ſtation; which, for its uſefulneſs and grandeur, was called Greenwich Hoſpital. It was unfortunately

built

built near a marſh, upon a moſt unhealthy ſpot of ground. The effects of this unhealthy ſituation were, that when a patient was ſent thither with only a mild intermitting fever, this mild indiſpoſition was often changed into a malignant fever, a bloody flux, or ſome other mortal diſtemper. The yellow fever often reigned there, attended with the moſt profuſe evacuations of blood, by vomiting, ſtools, and even by every pore of the ſkin, when no ſuch ſymptoms occurred in patients whoſe caſes had been ſimilar, and who were permitted to remain in their ſhips. The recovery of patients in that hoſpital was obſerved to be very tedious and uncertain: the leaſt irregularity brought on a relapſe. After a flux had been ſtopped for ſome days, the eating of any ſort of food which had a putrid tendency, ſuch as even a meſs of broth, would, ſometimes in a few hours, bring on a return of the diſeaſe, accompanied with all its violent ſymptoms. Neither did this proceed from any infection in the hoſpital, or from its being too much crouded with patients: theſe things happened even when there were only a ſmall number of patients in it, and

thoſe lodged in the beſt aired and in the cleaneſt wards. The mortality in this hoſpital was ſo great, and the cauſe of it ſo obvious, that there was a neceſſity for relinquiſhing it: no more ſick were permitted to be ſent thither; and another hoſpital, in a better air, is now fitted up for their reception.

Laſtly, we may obſerve the excellent effects produced by removing the ſick from an unhealthy into a pure air, when labouring under even the moſt fatal diſeaſes.

We have already ſeen, that the men in the Middleburgh ſhip of war, ſpeedily recovered upon being carried to ſea. Their fluxes and fevers then loſt the dangerous ſymptoms, and an immediate ſtop was put to the mortality which raged among them at Curaçoa. During the ſickneſs at Cadiz and Penſacola, the removal of the ſick into ſhips, which lay at anchor in a pure air, produced the ſame happy effects.

A malignant ſickneſs in the iſlands of Grenada and the Grenadines, proved very fatal to the Engliſh, who, upon the concluſion of the peace in 1763, firſt went over to ſettle there; and it was obſerved, that ſuch

of

of the sick as were put on board the ships to be sent to Barbadoes, generally recovered at sea, before they reached their intended port.

Numerous observations might be given, to confirm what has been advanced on this subject, but to multiply them is unnecessary; as the effects of a change of air even upon agues and fevers in England are well known, and as the immediate success which attends the use of the bark, and other remedies, in a purer atmosphere, is ascertained by daily practice.

It remains only to be added, that, in the most malignant diseases, the immediate removal of the patient into a purer air is often the only method to preserve his life.

Thus when the Medway and Panther suffered great distress at Batavia, by a violent and mortal fever, of which we have already taken notice; all those who had been seized on board the Medway, as soon as she put to sea recovered immediately, to the number of 35 or 40: whereas the Panther, by continuing at Batavia a fortnight longer, lost above 50 men; and although there were some few who died on board the Medway, after she left Batavia, they were only such

as had been long ill, and who ſeemed to periſh for want of proper neceſſaries and reſtoratives at ſea. Upon leaving that unhealthy port, the fever entirely diſappeared.

It is not to be underſtood, that ſo fortunate a circumſtance will always attend ſhips, upon their leaving an unhealthy place: the effects of the injury already received on ſhore, from the land air, may not appear till ſome time after the ſhip has been at ſea; or a contagion may be generated, even at ſea, from cauſes which it is difficult to aſcertain.

Two queſtions naturally ariſe from the ſubject, equally curious and important.

Firſt, How long a taint from the land air may lie concealed within the body, before it produces a fever?

Secondly, How far this fever is contagious?

With regard to the firſt queſtion, from comparing many inſtances of people, who have ſlept on ſhore during the ſickly ſeaſon, and in conſequence of it, who alone have been taken ill out of the whole ſhip's company, then lying in an open road, it appears, —That ſome are immediately ſeized with ſickneſs or delirium; many are not ſeized

with

with them till they have been on board for two or three days; several have been only slightly indisposed, for the first five or six days; and in a few, the symptoms of indisposition have not appeared before the tenth or twelfth day.

How far this fever, as produced by the land air, is contagious, it is more difficult to determine; the exemption from it, which those generally enjoy who sleep at a distance from the shore, while others, who have suffered by a neglect of that precaution are sick on board, seems to prove it void of any contagion. But, upon a more narrow examination, we shall be inclined to adopt a contrary opinion. Passing in silence the many means whereby infection may be communicated, so as to elude the strictest enquiry, not only immediately from the diseased person, but from his clothes or attendants, we need insist only on positive facts.

In the Weasel and Hound, two sloops of war, which happened to be in the river Gambia, in the beginning of August 1769, at which time the rainy season commenced that year, it was observed, the sickness did not begin till two or three days after they had re-

ceived an infected perſon on board, notwithſtanding they had been eight or ten days in that river. Their being at the ſame time expoſed to the land air, almoſt equally with thoſe who were in the fort, by anchoring up the river, might greatly increaſe the malignity of the diſeaſe; but does not weaken the opinion of its being received by contagion, which is fully proved by a curious particular given by Mr. Robertſon, in an account of his own caſe.

This gentleman, when feeling the pulſe of a boy dying in the fever, immediately as he expired received a ſhock, as though elictrified, attended with a diſagreeable ſenſation, not eaſily to be expreſſed, and quickly followed by a proſtration both of ſtrength and ſpirits, ſo that he had almoſt fainted before he reached his apartment; and afterwards ſuffered a very ſevere attack of the fever.

Both theſe poſitions will receive farther confirmation by what occurred on board the Merlin ſloop, which was at Gambia in the ſame month, the preceding year.

She continued ſix days in the river, employed in wooding and watering. While there, all the men were in perfect health, but

but in about two days after they put to sea, those who had been employed in wooding were successively taken ill; afterwards those who had been employed in the duty of watering, were seized in the same manner. At first these men alone were seized with the fever, and several of them in a day continued to fall sick for six or seven days; at length almost all that had been employed on those services were ill; after them, their attendants were seized with the fever, and in such numbers, as to leave no doubt of the disease being infectious.

Many other instances may be produced of a similar nature, which, from their number, it will be unnecessary here to mention.

We may thence justly conclude, that the fever may be communicated by contagion; but that this contagion is very slight, unless co-operating with a bad air; and in a ship is often greatly checked, if not wholly destroyed, by going out into the open sea. For notwithstanding the virulence of the distemper was greatly enforced in those sloops, when up the river Gambia, by being constantly exposed to the noxious land air; yet it was so much checked, upon those ships putting

putting to ſea, that they ſcarcely buried one tenth of the men which the fort generally does every rainy ſeaſon, out of a proportional number. For of ninety men, which each of theſe ſloops had on board, the Weaſel loſt in that fever ten, the Hound ſix, and in the preceding year the Merlin four, being 20 in all, out of the number of 270, who were on board thoſe ſloops.

A virulent contagion may indeed occur in ſhips at ſea, but that generally proceeds from other cauſes, into which our ſubject does not at preſent permit us to enquire.

SECT. VIII.

The ſea air beneficial in fevers; its effects in an epidemical fever at Naples. An infirmary-ſhip recommended: Its peculiar advantages. Of ſeaſoning the conſtitution to hot climates. Sudden changes from cold to heat, and heat to cold, productive of the ſame diſeaſes.

WHETHER there be any quality in the ſea air, beſides its purity, that renders it ſo particularly healthy to patients labouring under thoſe remitting fevers and

and other diseases, which are the subject of this treatise, I will not take upon me to determine; my intention is to advance facts, and not conjectures. This much is certain, that in some other fevers also, a change of air has been found very beneficial; the recovery of the patients has been greatly promoted, by removing them from inland places into the sea air.

In the year 1764, the kingdom of Naples furnished a very remarkable example of the healthiness of the sea air, and of the benefit of removing the sick thither, during the rage of an epidemic fever. For the account of this fever, as well as for many useful observations given in this work, I am obliged to my friend Sir John Eliot, an eminent physician in London.

" From bad policy in permitting too great an exportation of corn, there was not a sufficient store left in the public granaries of Naples, and the country became destitute of provisions. In the months of April and May, the scarcity was so great, that the poor people tore up the grass and green corn for subsistence, and fed on every thing, in which they supposed there was any nourishment.

" A ma-

" A malignant fever came on, and raged with more violence, as the famine increaſed. Hunger drove multitudes of people from the country to the capital, in hopes of being better able to procure ſubſiſtence there. The city became more and more crouded, and every day numbers dropped down dead in the ſtreets. The force of hunger became ſo ſtrong as to break through the firmeſt ties of nature; mothers threw away their children, fathers forſook both; each perſon being fully employed in ſearch of food for himſelf. So great and ſo general was this ſcarcity, that villages became depopulated by death and migration.

" The kingdom contained about two millions of people, one fifth of whom it is ſuppoſed to have loſt by this calamity: two hundred thouſand by death, the reſt by deſerting their habitations, to ſeek ſubſiſtence in the neighbouring countries.

" The ſituation of Naples is remarkably healthy; it is very populous, the ſtreets are numerous, the houſes five or ſix ſtories high, and very much crouded. The inhabitants are extremely remiſs in the article of clean-

lineſs,

lineſs, both within and without their habitations.

" When we conſider all theſe circumſtances, the heat of the climate, and the want of proper food, it will not appear ſurpriſing, that this malignant fever raged with uncommon violence and was every where propagated, from the number of ſick diſperſed up and down, in all quarters of the city, the little care taken of them, and the negligence in burying the dead. The abſurd cuſtom of expoſing bodies to view, when carrying to the grave, might even add to the progreſs of the diſtemper.

" This malignant fever was accompanied with worms in the ſtomach and inteſtines during the month of May; in June worms were leſs frequent. In July, it became highly infectious, was attended with petechiæ, ſwellings of the parotid glands, obſtinate delirium, violent vomiting, and fluxes of blood."

This diſeaſe raged, with unremitting violence, for a conſiderable time, till it was happily obſerved, that the ſick who were moved into the hoſpitals near the ſea, recovered much quicker than in other places,

and

and few of them died. Upon this being represented to the king, money was ordered out of the treasury, for the fitting up of other hospitals near the sea. In these hospitals, well ventilated, and open to the sea air, the progress of the contagion was entirely stopped; none of the nurses or attendants on the sick were infected: and even when they became crouded with sick, the number that died in them was inconsiderable in proportion to the number who died in other places *.

To return to our more immediate subject, it would be proper, during the sickly season, on the coast of Guinea, and all places in the East and West Indies, where the English factories are near the sea, to have another ship, besides that appropriated for the residence of the gentlemen of the factory, fixed at a proper distance from the land, to receive the sick immediately upon being taken ill.

* Vegetable acids in large quantities, ice water, and the bark were the great remedies. Musk was found useful in relieving the head-ach.

Mineral acids, where livid blotches and other malignant symptoms appeared, were administered with good effects.

It

It would be a certain means of saving many lives. This ship might be considered as an hospital for the factory.

The name of hospital, or hospital ship, may convey a frightful idea of sickness and mortality to some people, but without reason; on board such ship, if kept perfectly clean and never crouded, the sick may be well accommodated, and will always breathe the purest air. Upon the least suspicion, infection may speedily and effectually be removed by the methods given in my Dissertations on Fevers and Infection.

In Europe all nations have hospitals; and many of them have found it absolutely necessary to erect hospitals or infirmaries for the sick, in their settlements and factories abroad. The difficulty is to find a convenient and healthy spot: the manner of obviating this we point out, by proposing to have the hospital upon the water. Thus a ship or hulk moored at the mouth of the river Senegal, and properly fitted for the reception of the sick, in that garrison and factory, would in a great measure put an end to the dreadful mortality amongst our troops and settlers in that part of the world: transferring

ferring the ſick and their hoſpital, from the land to the water, is more particularly recommended to that ſettlement, as it becomes an object not only to the merchants but to government, on account of the ſoldiers ſtationed there, to whom it would be attended with many advantages.

In the firſt place, on board a ſhip, with proper care, a greater degree of neatneſs and cleanlineſs may be procured for the ſick, by means of funnels pointing to the ſea, and waſh cocks, to cleanſe them occaſionally, than in moſt infirmaries on land.

2dly, When it is difficult to procure good water on ſhore, they may at ſea be ſupplied with the moſt wholeſome freſh water, from the element which ſurrounds them, by a ſimple diſtillation; a diſcovery which the author of theſe ſheets was ſo fortunate as to make in the year 1761*: if more be wanted for common uſes, ſails or awnings, properly extended, will procure them a ſufficient quantity of rain water.

Here it may not be improper to take no-

* See the Appendix, and Eſſay on preſerving Seamen.

tice

tice of a common opinion, which prevails in thofe parts, that fuch, as have been thoroughly wet with rain or other frefh water, will from thence fuffer no indifpofition, provided before putting on dry clothes they dip themfelves in fea water, or wet their fkin all over with a fpunge dipped in it.

3dly, A more free circulation of air can be obtained in a fhip than on fhore. I have, in a former publication*, pointed out the methods of rendering the air in a fhip at all times wholefome, by means of purifying fumes and fires; I may now add, that when ventilation, or a change of air becomes neceffary, it may be more effectually accomplifhed in a fhip, by opening fome port-holes, than in moft chambers on land. A ventilator may likewife be provided, for more effectually keeping dry the timber and the lower apartments in the fhip; this may be worked by a wind-mill fly; or the ventilator itfelf may confift in a wind-fail. It is neceffary to obferve, that all thefe ventilators fhould be made ufe of only during dry weather. For the prefervation of the fhip,

* Effay on preferving Seamen.

the bottom ſhould be ſheathed with copper. From the rains the ſhip may be defended by a timber ſhade or ſpar deck, projecting a little over her ſides: which will alſo afford an effectual protection from the violent heat of the ſun during the intervals of the ſhowers, and occaſion an agreeable ventilation, when there is any, the leaſt wind.

4thly, Beſides the benefits of dry, neat, and clean accommodations, good water, and a pure air, it is in the watery element that the moſt wholeſome nouriſhment, and the moſt proper food for the re-eſtabliſhment of health, is to be found: I mean, a great plenty and variety of fiſh. When the ſick in thoſe countries can be ſupplied with green turtle, they recover very quickly, not only from the ſcurvy, but from moſt diſeaſes proceeding from a relaxed habit of body and a watery ſtate of the blood. It has been often remarked, that fluxes, dropſies, and an infirm conſtitution, which are the frequent conſequences of acute diſeaſes in thoſe climates, proceed in a great meaſure from the low poor diet of the country. This conſiſts chiefly of boiled rice, lean goats, fowls, and food of that kind; which

render the recovery of Europeans extremely ſlow and tedious. In thoſe climates, fiſh caught at ſea are with difficulty procured for ſick or weak people on ſhore, as they cannot be preſerved freſh many hours, and are often tainted before they can be brought on ſhore. They are ſo apt to corrupt, even during the coolneſs of the night air, that it is a prevalent opinion among the fiſhermen there, the moonlight has a quick and powerful influence in ſpoiling them.

By a peculiar bleſſing of Providence, not only the river Senegal, but all the great rivers whoſe ſources are within the tropics, have depoſited, by their annual inundations, great quantities of ſlime and mud at their openings into the ſea, which form what are called the bars to thoſe rivers. Thoſe bars or ſhoals, conſiſting of a fine ſoft ooze, often extend themſelves many miles from the land, and afford not only a ſafe anchorage for both the floating factories and infirmary ſhips, but alſo abound with an incredible quantity of excellent fiſh. One man in the infirmary ſhip, lying off Senegal, or in moſt other places on the coaſt of Guinea, will be able to catch as many fiſh, of

different ſorts, in two hours, as will be ſufficient for the nouriſhment of a hundred ſick people. It has been found by experience, that no food whatever contributes more to the perfect recovery of health and ſtrength, and to the prevention of the fatal conſequences of fevers in hot climates, than fiſh, or rich nouriſhing fiſh-ſoup, warmed with the ſpices of the country, and, if neceſſary, rendered palatable by the addition of lime-juice.

Upon the whole, the immediate removal of the patient from a bad air, as ſoon as he is perceived to be affected by it, into the infirmary ſhip, will, in all probability, render his diſeaſe mild and curable, and his recovery ſpeedy and perfect.

The conſtitution of Europeans, preſerved by theſe means, will become in a courſe of time ſo ſeaſoned and habituated to the climate, that it will be afterwards much leſs ſuſceptible of any injurious impreſſions, either of the air or ſoil. One merchant, factor, or ſoldier, thus ſeaſoned to the country, becomes more uſeful, and his ſervices may be more depended upon, than ten newly arrived, unſeaſoned Europeans.

It has been a received opinion, that the firſt fever, or fit of ſickneſs, alters the conſtitution, ſo as to ſeaſon it to a new climate; but I do not find this ſupported by experience; ſudden changes of climate are generally the cauſe of ſickneſs; a ſeaſoned conſtitution, in any part of the world, is chiefly to be acquired by remaining there for ſome length of time, and a fit of ſickneſs by weakening the conſtitution in general diſpoſes to future returns of it.

From the very numerous opportunities I have had of knowing the general ſtate of health, enjoyed by the ſeamen on board his Majeſty's ſhips in foreign voyages, it appears, that ſudden changes from heat to cold, or from cold to heat, produce almoſt ſimilar effects.

When a number of ſeamen and ſoldiers ſail from England to the Weſt Indies, and are immediately landed, thus feeling the full effects of a ſudden tranſition from a cold climate to a very great degree of heat, many of them will be ſeized with a diarrhœa.

In like manner, if the ſtationed ſhips from the Weſt Indies, which are generally relieved at the expiration of three years, ar-

rive upon the coaſt of England in the winter, and by contrary winds are kept long expoſed to the cold, the men having been accuſtomed to a hot climate, will again be attacked with diarrhœas; the cure or removal of which will entirely depend, on keeping the patients warm.

The men immediately landed in the Weſt Indies will alſo be liable to the fevers of the country, and ſuch of them as drink immoderately of new rum, to ardent fevers. But if ſuch men before being landed are kept on board of ſhip much at ſea, and the ſhip does not put into any very unhealthy port, eſpecially during the ſickly ſeaſon, they will be in a great meaſure exempted from thoſe fevers; and after being twelve months in the Weſt Indies they will become ſeaſoned to the climate, and will frequently enjoy as good a ſtate of health as if they were in England.

CHAP.

CHAP. II.

Advice for the preservation of such Europeans in hot Climates as reside in inland Countries.

SECT. I.

Europeans during the sickly season to retire to healthy situations. Unwholesome spots of ground to be found in the most healthy countries, and healthy spots in the most sickly countries. Purity of the air in many places in the Torrid Zone.

WE come now to point out a method of preventing the mortality which attends Europeans in those situations, where the advantages of a floating factory cannot be enjoyed. It is to be hoped, for the sake of humanity, that those who have the power of directing, will pay some regard to it.

Many inhabit inland places, at a diſtance from the ſea; others cannot have the benefit of a ſecure retreat on that element, from the want of a ſafe anchorage for ſhips, at the neceſſary diſtance from the ſhore. It is ſometimes difficult to procure a convenient retreat upon the water, as in places where unwholeſome marſhes are formed, by frequent inundations of rivers or the ſea; or where the ſhores are lined with ſtinking ooze, mud, and aquatic plants of a noxious quality.

Under theſe circumſtances, Europeans during the ſickly ſeaſons, muſt retire into the country, to ſome healthy ſpot in their neighbourhood. Upon this occaſion it is neceſſary to recapitulate our two former poſitions.

1ſt, That the moſt healthy countries in the world generally contain certain ſpots of ground, where ſtrangers are ſubject to the attacks of ſickneſs.

2dly, That there is hardly to be found any large extent of continent, or even any iſland, that does not contain ſome places, where Europeans may enjoy an uninterrupted ſtate of health during all ſeaſons of the year.

In

In proof of the firſt poſition, I may inſtance as healthy a piece of ground, for its extent, as any in England; I mean the Iſle of Wight. This Montpellier of England, for its air and productions, has a ſmall town called Brading, where agues prevail much, which, on account of their obſtinacy, are by the iſlanders called Kentiſh agues. This diſorder, which is little known in many places of the iſland, often does not extend itſelf a mile from Brading, and is particularly inveterate in one farm-houſe in that neighbourhood.

The healthy iſland of St. Chriſtophers in the Weſt Indies has its Baſſeterre, and Barbadoes its Bridgetown, which prove ſickly to ſtrangers at particular ſeaſons; while the other parts of thoſe iſlands are remarkably healthy and pleaſant.

As a proof of the ſecond poſition, I ſhall offer Antigua. This iſland, eſpecially near Engliſh Harbour, is remarkable for its unhealthfulneſs; as our ſhips of war frequently experience, in the loſs of their men by the yellow fever and flux, when they refit in that harbour. But an abſolute ſafety, and a ſecure retreat from theſe diſeaſes, are

to be found in the high mountains of that iſland, eſpecially in that called Monk's Hill, of which the following affords a convincing proof.

In the beginning of the French war, about the year 1756, when the French neutrals were removed from Nova Scotia, a ſhip bound to Virginia, in which they were embarked, was driven, by ſtreſs of weather, to the iſland of Antigua. This mixed company of men, women and children, were all ſent to Monk's Hill, in order to recover from the fatigues of their voyage. Soon after this, a general ſickneſs raged in the iſland. Our ſeamen in Engliſh Harbour during it ſuffered a great mortality by the yellow fever and flux; but the Engliſh ſoldiers, who compoſed the garriſon at Monk's Hill, and the neutral French, though but lately arrived from their cold native country, Nova Scotia, enjoyed a moſt perfect ſtate of health, and were totally exempted from the prevailing diſtempers of the iſland.

When the Engliſh troops were at Guadaloupe, they found one part of that iſland extremely pleaſant and healthy; and another part

part of it so sickly, that when a regiment or company of soldiers was ordered thither, they were certain of losing a great part of their number.

The island of Dominica is in most places woody and unhealthy, especially about Prince Rupert's Bay; yet there are several French families in it, who by fixing their residence on the sides of hills, live free from the attacks of agues and fevers, the diseases common there; and thus enjoy a good constitution and as firm a state of health as if they were in France.

In the unhealthy island of St. Jago, there is a place called St. Domingo, where on account of its wholesome air, it is usual for the governors, upon their arrival from Europe, to spend some time before they venture to fix their residence at the capital: by this means they gradually become seasoned to that sickly climate.

In the neighbourhood of Mobile, Pensacola, and other places in the most unhealthy parts of West Florida, there are several elevated situations, dry, and exposed to the winds, which would afford a safe retreat from

from the diſeaſes which prevail in the months of July, Auguſt, and September.

The country of Braſil is eſteemed by the Portugueſe a paradiſe, chiefly on account of the purity of its air in moſt places. When the ſun is vertical, the air is refreſhed and cooled by the ſea breezes; and its inland parts are fanned, with ſtill cooler breezes, from the high mountains. So that the Portugueſe prefer the air of the Braſils, at the ſmall diſtance of a few degrees from the Equator, to that of their native country.

From 10 degrees north of the Æquinoctial, to 55 ſouth, there runs through the continent of America a continued chain of very high mountains, called the Andes or Cordilleras. The tops of thoſe mountains, even under the Equator, are covered with ſnow, and, by reaſon of the ſeverity of the cold, are rendered uninhabitable to man or beaſt. In deſcending from thence, the traveller begins to breathe a healthy and temperate air, where the joyful ſeaſon of ſpring, with all the early productions of nature, preſent themſelves. Deſcending ſtill lower on the ſides of thoſe mountains, he finds himſelf ſurrounded with rich and luxuriant paſtures,

paſtures, breathing forth the odours of a pleaſant and ſerene ſummer.

Thus, under the ſcorching heat of a vertical ſun, there are large extents of country, where Europeans may breathe a pure untainted air, of ſuch a temperature as beſt ſuits their conſtitutions.

Heat does not altogether depend upon a proximity to the Equator, but varies at inconſiderable diſtances, chiefly according to the elevation of the ground, the degree of ventilation, and the nature of the ſoil.

Upon the ſoil, the temperature of the climate, the colour, ſtrength, and activity, the conſtitutions and health of the inhabitants greatly depend. This truth is well known to thoſe who trade for ſlaves on the African coaſt. The negroes they purchaſe are dull and ſtupid, lively and ingenious, ſickly or robuſt, long or ſhort-lived, according to the nature of the ſoil in the country from whence they are brought.

SECT.

SECT. II.

An elevated and temperate ſituation on the ſide of a hill recommended, as a retreat from ſickneſs, in hot climates. This aſylum for health to be met with in almoſt all parts of the world.

FROM the preceding poſitions I infer, That the ſafeſt retreats, not only from the ſultry heats, and the inundations of a low country, but alſo from the ſickneſs attendant upon them, are to be found on the ſides of hills or mountains, where there are no moraſſes within three miles; preferring ſuch places where the vapour ariſing from the ſurrounding vallies cannot affect them, at leaſt in its perpendicular aſcent. Experience fully confirms this truth, That in ſuch elevated and temperate ſituations, where the ſoil is dry, gravelly, and clear from wood, ſhrubs, or ſtagnating water, Europeans enjoy good health in the hotteſt climates, during all ſeaſons of the year.

This aſylum for health is to be met with in

in almost every quarter of the globe. The weary traveller, even in some parts of the sultry desarts of Arabia, may, in the middle of summer, behold from afar the summits of the Persian and Turcomanian mountains covered with snow, and their sides lined with a refreshing verdure, which is constantly fanned with a pure and temperate air.

Most of our principal factories in the East Indies have in their neighbourhood places of easy and safe retreat from sickness during the wet season. In Sumatra, Fort Marlborough affords a retreat tolerably safe and convenient, at the distance only of three or four miles from our sickly settlement of Bencoolen: in this fort the English merchants ought constantly to sleep during the sickly season, and for some time after it; others, who choose it, may go to Sillebar. The unhealthy town of Calcutta, in Bengal, has in its neighbourhood the healthy situations of Barasatte and Garatte; where the gentlemen residing at Calcutta should retire, in the months of July, August, September, and October. Both Charnagore and Chinsura, the French and Dutch settlaments in Bengal, are more healthy than Calcutta.

The

The Dutch at Batavia, for the benefit of a quick and eafy conveyance of fuch as are in a convalefcent ftate, have made an excellent road, for 70 miles, leading from that city to the mountains, equal to any turnpike road in England. It were to be wifhed, that not only convalefcents, but fuch fick perfons whofe cafe will admit of fo long a journey, were alfo fent thither, or at leaft to the more healthy fituations of Cerebon, Samaring, or Tanjapour, in its neighbourhood.

The Englifh at Bombay enjoy the benefit of having feveral rifing grounds near them, from whence, during the rainy feafons, they may in fafety behold the adjacent country covered with water. During the rains innumerable pools of ftagnating water are formed, which quickly become full of frogs and * fifh: on the pools drying up thefe corrupt, and their ftench proves very injurious to European conftitutions.

* It is a phænomenon inconteftibly true, that in ftagnating pools of water at Bombay, produced folely by the rains, which have no communication with any river or the fea, living fifh are generated; many perfons have eaten of them: upon the drying up of the pools they die and frequently are very offenfive.

Within

Within nine miles of Madrafs ftands the mount St. Thomas, juftly efteemed, for its air, the Montpellier of the Englifh fettlements in India. Perfons labouring under a violent intermitting fever at Bengal, are commonly no fooner brought to Madrafs, than their diftemper leaves them. Such as have been reduced to fo great weaknefs, as to be under the neceffity of being carried up to St. Thomas's Mount, have in three or four days acquired fuch a degree of health and ftrength, as to be able of themfelves to afcend 127 fteps made in that rock, for the more eafy accefs to this paradife of health.

Not only continents, but moft large iflands in every quarter of the world, have ridges of high mountains, where the air proves healthy to European conftitutions. Even in the fmaller iflands, fuch a retreat can generally be found.

Among the iflands poffeffed by the Englifh in the Weft Indies, I have already mentioned Monk's Hill as affording a fafe retreat from ficknefs in Antigua. We have taken notice of the wholefomenefs of the air in the mountains of Dominica. In the healthy and pleafant ifland of Barbadoes there is a

hill, called Scotland or the Highlands, where the air is purer and more wholeſome than in any other place. It is to be hoped, that as Granada and the Grenadines, which have proved ſo fatal to the Engliſh planters, are cleared of woods, due attention will be given to eligible ſituations for houſes; the advantages of which we have ſo ſtrongly pointed out: we ſhall then hear nothing more of fatal diſeaſes ſweeping off the inhabitants of theſe iſlands.

SECT. III.

An application of the directions to the iſland of Jamaica.

WE ſhall now collect the whole of our directions, by an application of them to the iſland of Jamaica.

Jamaica has one continued ridge of mountains running through it, from eaſt to weſt, beſides ſome ſmaller hills. On the ſides

ſides of thoſe mountains the air is temperate and cool, while the vallies are ſcorched up with exceſſive heat, or overflown by violent rains.

Part of this mountainous ridge is at no great diſtance from Spaniſh Town, the capital, nor from Kingſton or Port-royal, the principal ſea-port. Therefore, if choſen ſpots of ground on thoſe mountains were ſet apart, ſome for the receſs of families in health, and others for the reception of the ſick, the moſt beneficial conſequences would reſult to the white inhabitants of that iſland.

We do not recommend a retreat to the barren, cold, and bleak ſummits of the Blue mountains; where the ſudden tranſition from the ſcorching heats of the vallies, to ſo intenſe a degree of cold, muſt be injurious to the conſtitution: nor a retreat to ſuch an height, as where the vapours are condenſed into miſts or clouds. But we recommend a removal into a more temperate and pleaſant ſituation: where the heat of the day ſeldom exceeds 70 degrees on Farenheit's thermometer, and the cold of the night is not under 54 degrees: where the

the ground is cleared from wood, and has no ſtagnating water upon or near its ſurface: where the ſoil is rich and fertile, favourable to the cultivation of European plants, and to the health of European animals: and where ſheep brought from England ſtill retain, without inconvenience, their fleecy covering.

There are large flat ſpots of ground in thoſe mountains, which, by induſtry and cultivation, might be converted into the moſt healthy and delightful rural retirements. In many places there, where at preſent the chillneſs of the evening renders a fire comfortable, and even requiſite to an European conſtitution, the improvement of the ſoil would gradually mend the quality of the air.

Governors, newly arrived at Jamaica, of whom many have died ſoon after their landing, or any gentleman who can afford to keep a horſe or carriage, after doing buſineſs at Spaniſh Town or Kingſton, might, before ſun-ſet, return to ſuch a healthy and pleaſant country ſeat as is here recommended; taking the precaution of never ſleeping elſewhere during the ſickly ſeaſon.

But

But without respect to a governor, or any particular person, this proposition, in a more extensive point of view, demands the most serious attention. Though the island of Jamaica is, at present, much healthier than formerly, yet in certain months of the year it is infested with fevers and fluxes: which in some years prove very epidemical and fatal.

It will be found, that the most certain means of preserving such a number of Europeans as frequent that island, nay, their chief security upon their first arrival, consists in this, that those whose circumstances and business will permit, should retire, especially during the night, to the mountains for health, until they are seasoned to the climate; and that others, who cannot afford this precaution, be immediately removed thither when taken ill.

The sick at Kingston, or Port-royal, may be carried in an easy and commodious vehicle, six or seven miles to the hills in the parish of Leoganie; or they may have the benefit of water carriage to Port Passage, and from thence be conveyed to the hills near Spanish Town, when proper houses are

built for their accommodation in that cool and wholeſome air.

It is certain, that a perſon labouring under a fever, or flux, will be much leſs endangered by being conveyed 20 miles on his bed, in a proper carriage, than by continuing 20 hours in the air which produced his diſtemper. The immediate removal of the patient, in ſuch caſes, into another air, often abates the moſt alarming ſymptoms of the diſeaſe, and that even in a few hours.

When the Lion, Spence, and ſeveral other ſhips of war, were employed at Port Antonio, in the iſland of Jamaica, in clearing Navy Iſland of wood, in order to build wharfs and ſtore-houſes there, many of the men, when cutting down the wood, were ſeized at once with a fever and delirium. This attacked ſo ſuddenly and with ſo much fury, that often the perſon ſeized would with his hatchet, if not prevented, have cut to pieces the others who ſtood near him. Orders were iſſued, that as ſoon as the men were thus ſeized, they ſhould be bled, and immediately ſent on board their reſpective ſhips. The conſequence was, that all who were carried on board quickly recovered; whereas

whereas thoſe who remained on ſhore, either died, or ſuffered a dangerous fit of ſickneſs.

It was formerly not uncommon for ſix or eight of the centinels who were poſted at Greenwich hoſpital in Jamaica, which was ſituated in a marſh and is now evacuated, to be taken ill in one night, with copious vomitings or purgings, a delirium, and all the alarming ſymptoms of a violent fever; of which they recovered in ſome hours after they were removed to Kingſton.

But ſhould a change into a purer air fail to produce ſuch immediate effects, it will at leaſt mitigate the ſymptoms of the fever; the uſe of medicines will afterwards be attended with more ſucceſs; and the patient will recover ſooner, and will more ſpeedily regain a vigorous ſtate of health.

I ſhall here inſert an obſervation, communicated to me by a very ſenſible man, who reſided long in Jamaica.

"I have often obſerved the poor ſeamen "in the merchant-ſervice to recover from "the yellow fever, ſolely by having the "benefit of a free and conſtant admiſſion "of the cool ſea air, into a ſhip anchored

"at a diſtance from the ſhore, where they "lay utterly deſtitute of every aſſiſtance in "ſickneſs. and even of common neceſſa-"ries, having nothing but cold water to "drink, and not ſo much as a bed to lie "upon; while gentlemen, newly arrived "from England, by being ſhut up in ſmall, "cloſe, ſuffocating chambers at Kingſton, "or Port-royal, expired with their whole "maſs of blood diſſolved, flowing from "every pore; the ſtifling heat of their "room having produced a ſtate of univer-"ſal putrefaction in the body, even before "death."

What I have ſaid of Jamaica, is applicable to every unhealthy ſpot of ground, and to all our iſlands and plantations, both in the Eaſt and Weſt Indies.

SECT.

SECT. IV.

Particular Exceptions of no force against general observation. Fatal effects of remaining all night in unhealthy places. Sickness arising from that circumstance, vulgarly ascribed to ridiculous causes. A change of Air beneficial in all epidemical distempers.

IN opposition to what has been said, it may be urged,—That in several places, mentioned as a secure refuge from sickness, there are instances of persons being seized with the diseases of the adjacent country. The yellow fever has been known to seize persons in the garrison of Monk's Hill in Antigua!

But inferences drawn from a few uncommon cases, have no force against general observation and experience. Even in England I have met with instances of all the West India diseases, yet there is no person who on his return to it does not in a general view consider himself exempted from their attack. In a long course of practice, I have seen the tetanus, emprosthotonos, opisthotonos, and locked

locked jaw in as violent a degree as occurs under the torrid zone: and have ſeen the dry belly-ach, the black vomit, the hepatitis, all diſeaſes in a manner peculiar to ſultry climates. I may therefore juſtly adhere to the principles already laid down.

Unleſs the garriſon of Monk's Hill had been appriſed of the danger of ſleeping in unwholeſome places, and had cautiouſly avoided ſleeping out of the garriſon, the queſtion cannot be fully determined, whether perſons who never ſlept out of Monk's Hill, were attacked with the diſeaſes of the adjacent country? It is my opinion they ſeldom or never would.

I mentioned the affair to a perſon who had reſided long at Engliſh Harbour in Antigua, and he informed me, that he had known ſome of the garriſon on Monk's Hill to have had the yellow fever. I deſired he would endeavour to recollect the circumſtances of their being taken ill, and whether they had ſlept any nights preceding their illneſs in the low grounds, or in Engliſh Harbour; it immediately occurred to him, that when he was ſeized with the yellow fever, there were at the ſame time two officers be-

longing to the garrison at Monk's Hill labouring under it, who had both been seized with it early in a morning, after sleeping the two preceding nights at English Harbour. Upon beginning to consider the great danger of sleeping in unhealthy places (with which he was before entirely unacquainted) he recollected, that most of the people in Monk's Hill who had been seized with this fever, were taken ill after sleeping on the low grounds; it being a common custom among the officers of that garrison to sleep in the house at English Harbour, where they dined and supped.

If persons will run the hazard of their health and life, by remaining all night in unhealthy places, they cannot expect to reap the benefit of safety and security from a healthy air in their neighbourhood.

Additional proofs may be brought of the melancholy effects of inattention to the important advice of never sleeping in unhealthy places; which I hope will serve farther to prove the utility, and to enforce the observation of the directions which we have recommended.

In the year 1766, sixteen French protest-

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ant families, consisting of sixty persons, were sent, at the expence of the English government, to West Florida. The ground allotted for their residence was on the side of a hill, surrounded with marshes, at the mouth of the river Scambia. These new planters arrived in winter, and continued perfectly healthy until the sickly months, which in that country are those of July and August. About that time eight gentlemen (from one of whom I received this account) went to this new settlement to solicit votes for the election of a representative in the general assemby of the province; by remaining but one night, every one of them was seized with a violent intermitting fever, of which the candidate for becoming the representative, and another of their number, died. The next day seven other gentlemen came upon the same business to this unhealthy spot; but by leaving it before night, they escaped the sickness, and all continued in perfect health. Among the French settlers during these two months, the annual fever of the climate proved so fatal on this unwholesome spot, that of sixty persons, fourteen only survived; and even those who remained alive,

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in the September and October following, were all in a very ill ſtate of health; not one of them had eſcaped the attack of the fever, and moſt of them died within a few months afterwards, from the injury it had done to their conſtitutions.

In a voyage to the coaſt of Guinea, performed in the year 1766, by the Phœnix ſhip of war, of 40 guns, the officers and ſhip's company were perfectly healthy, till, on their return home, they touched at the iſland of St. Thomas. Here the captain unfortunately went on ſhore, to ſpend a few days in a houſe belonging to the Portugueſe governor of that iſland. This happened during the rainy or ſickly ſeaſon. In the ſame houſe were lodged the captain's brother, the ſurgeon, ſome midſhipmen, and the captain's ſervants. But, in a few days after their being on ſhore, the captain, his brother, the ſurgeon, and every one, to the number of ſeven, who had ſlept in that houſe, were taken ill; and all of them died, except one, who returned to England in a very ill ſtate of health. The ſhip lay at anchor there twenty-ſeven days; during which time three midſhipmen, five men and a boy,

remained

remained on ſhore for twelve nights, to guard the water caſks, under pretence that the iſlanders would ſteal them; all of whom were likewiſe taken ill, and two of them only eſcaped with life. At that iſland, only thoſe who ſlept on ſhore were taken ill; no other man of the ſhip's company was ſeized with any diſtemper during their ſtay there. Even during the whole voyage, if we except theſe unfortunate perſons, only one man died, and he was killed by an accidental blow upon the head.

None of thoſe who ſlept on ſhore eſcaped the ſickneſs, and of them only three ſurvived it; a midſhipman, who has ever ſince been in a cachectic ſtate, for which he was a patient in Haſlar hoſpital; a ſeaman, in the ſame condition, who has ſince been twice under my care; and a molattoe, one of the captain's cooks, who not being able to regain a good ſtate of health in England, is now returned to Guinea, under a notion that he was poiſoned there, and can only be cured by medicines adminiſtered by the negroes.

The ſickneſs in this iſland began much about the time that the Phœnix arrived; and the governor had then taken his uſual

precaution

precaution at ſuch ſeaſons of the year, of retiring into the higheſt apartments of his houſe; where he lived in a great meaſure ſhut up from the acceſs of the external air, and from company.

Whilſt the Phœnix continued in this place, twenty or thirty of her men went daily on ſhore; ſome rambled about the iſland, hunting and ſhooting; others were buſy in bartering for proviſions, waſhing linen, and other neceſſary employments: ſo that almoſt all that ſhip's company, conſiſting of two hundred and eighty men, were, in their turns, aſhore upon the iſland in the daytime; not one of whom, who returned to the ſhip at night, was taken ill, or ſuffered even the ſlighteſt indiſpoſition.

Let all thoſe who are apt, upon ſuch occaſions, to attribute theſe accidents to the irregularities of the ſufferer, conſider how little probable it is that the few who remained all night on ſhore could have been guilty of greater exceſſes, or have committed more hurtful irregularities, than the reſt of the ſhip's company, who were aſhore in the day-time and yet eſcaped in health. I muſt likewiſe obſerve, that the ſprings of water

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in this iſland are remarkably pure and wholeſome; and though it lies directly under the equinoctial line, there is perhaps no ſpot of ground in the world more abundantly fruitful, or more pleaſant and delightful.

The common opinion, that thoſe people who ſleep on ſhore in ſuch places, are poiſoned by the negroes, is ſo ridiculous, that it hardly deſerves notice: If this is true, the negroes muſt be poſſeſſed of that poiſon only which communicates the endemic diſeaſe of the country, a fever, with its common conſequences, the dropſy, jaundice, or cachexy; for ſuch have I always found the condition of thoſe people who ſuppoſed themſelves to have received it.

Here I cannot help lamenting the untimely fate of thoſe gentlemen, with ſeveral of whom I was well acquainted; who were thus, by an imprudent conduct, cut off in the flower of their age, and, by continuing on board their ſhip, would in all probability have returned to England in perfect health. This was the caſe of all the officers and men belonging to his Majeſty's ſloop the Hound; who having performed the ſame voyage on this coaſt, arrived at St. Thomas before the departure

departure of the Phœnix from thence; and by taking the precaution of having the ship quickly provided with wood and water, without permitting any of the men to remain on shore in the night, arrived at Spithead in perfect health; not one of the men or officers having been seized with that fatal sickness in the island of St. Thomas, which cut off the captain, and so many of the gentlemen and seamen belonging to the Phœnix.

In the year following, the Phœnix made another voyage to the coast of Guinea, and happened again to touch at this island in the sickly season, where she lost eight men out of ten, who had imprudently remained all night on shore. At the same time, the rest of the ship's company continued in perfect health, who after spending the greatest part of the day on shore, always returned to their ship before night. On board the Hound sloop, then in company with her, only one man died during the whole voyage; the officers having been particularly careful not to permit any of the people to continue all night on shore in that place. This man was cut off by an obstinate intermitting

fever with which he had been firſt ſeized at Sheerneſs.

It may be urged, that there are frequent inſtances, of perſons labouring under the prevailing ſickneſs of a country, who have been carried on board ſhip, or into a better air, where the fever ſtill continued, without any mitigation of its ſymptoms, and at laſt proved mortal. But what we particularly recommended, was the immediate removal of the patient, upon the firſt attack of his illneſs; that is, in leſs than 24 hours after being ſeized with it.

I am ſenſible that the attack of a cholera morbus, a dyſentery, or even of the black vomit, may be ſo ſudden and violent, as to admit but ſmall hopes of a recovery, from a change of air; but it muſt be allowed, that ſuch violent and dangerous attacks are ſingular and uncommon. The want of ſucceſs, from the too late application of a remedy, or its failure in a few caſes, cannot, with propriety, be objected againſt its general efficacy.

In Jamaica, and other places, perſons recovering from fevers, are ſent to the mountains, for the re-eſtabliſhment of their health.

There

There when they begin to breathe the cool, refreſhing, and pleaſant air, their debility, and all the complaints proceeding from it, almoſt immediately leave them.

When a weakly European leaves the coaſt of Guinea, he no ſooner breathes the pure ſea air, untainted with the land effluvia, than he finds his health mended, his appetite and his ſtrength improved.

The change of air, in both theſe caſes, proves the moſt certain means for the perfect re-eſtabliſhment of health. Yet ſome whoſe conſtitutions have been much impaired, by the long and repeated attacks of ſickneſs in a bad air, or by the violence of their diſorders, may die at ſea, or in the wholeſome air of the hills.

Theſe are certain facts; and a little cool reflection upon them will ſerve to eſtabliſh it as an univerſal practice, in all diſeaſes proceeding from a bad air, immediately to remove the patient into an air more pure and wholeſome.

This removal will be found of great benefit, not only in thoſe diſeaſes which proceed from ſuch apparent ill qualities of the air, as have been often mentioned in theſe

ſheets, but in all diſeaſes whoſe rage is confined to a particular ſpot. It would alſo be of benefit, in a general ſickneſs, which may certainly be produced, independent of infection, by ſome latent intemperature of the atmoſphere, the ſources of which we cannot trace. It is not eaſy, from the ſenſible alterations in the air, as to heat, cold, moiſture, &c. to account for the greater violence of diſeaſes in ſome ſeaſons than in others: ſuch a difference in the air cannot always be aſcertained, as would ſeem adequate to the production of ſuch violent and obſtinate diſeaſes, or to their longer duration in one ſeaſon than in another.

Thus during the years 1765 and 1766, remitting and intermitting fevers were more frequent in ſome parts of Hampſhire, than they had been remembered for many years paſt: they continued to make freſh attacks, even in the cold month of December; inſomuch that at Chriſtmas 1766, I had no leſs than an hundred patients, labouring under agues and fevers. In the years 1767 and 1768, without any apparent cauſe, they became much leſs frequent than in the preceding years; and, in the years 1769 and

1770, they seldom occurred, even in the worst situations. But whatever were the latent causes of those unusual fevers, at that time, they were evidently confined to some particular spots of ground, and to particular houses and situations; and the removal of the patients into a better air then proved useful, as undoubtedly in parallel cases it always will.

I will conclude with observing, that generally in a period of eight or ten years, a violent epidemical sickness breaks out among our factors and colonists, in several places in the torrid zone. This was the case at Antigua in the years 1765 and 1766, where fevers raged with such violence, as to cut off almost a sixth part of the white inhabitants of that island. If this fever was not contagious, and only the usual and annual epidemic of the island, raging with its utmost violence; as was that in Hampshire, during the same years; it seems highly probable, that had the sick, when first taken ill, been removed into the air of Monk's Hill, many would have been alive, who are now no more.

The facts, which are here barely set down,

I leave to ſpeak for themſelves. The inferences, are ſo obvious, of ſuch extenſive utility, and ſo practicable, that one would think nothing more was requiſite to inforce their execution in all parts of the world.

SECT. V.

Directions more particularly for the coaſt of Guinea. Unhealthy ſettlements to be maintained by naturalizing the natives. Military eſtabliſhments in ſuch places to be recruited by criminals. Neceſſary directions for ſoldiers, &c. on board of Eaſt India ſhips.

I WILL add ſome few inſtructions with regard to the more unhealthy ſettlements on the coaſt of Guinea. The great mortality which Europeans ſuffer, in many places, on this coaſt, ſtrongly points out that ſome of the young natives ſhould be educated, and inſtructed in thoſe branches of knowledge, which may qualify them for acting as factors or merchants in the moſt unhealthy ſettlements.

settlements. Uncommon application, or great abilities in commerce, industry and integrity, may be properly rewarded. Those who possess such virtues, should be distinguished by particular privileges or honours; they should be naturalized; should be allowed to rise to a certain rank in the government or army; and should be intitled to other privileges of British subjects.

At Benguela, Catcheon, and other unhealthy places of Guinea, few Portuguese of the white colour are to be met with, except priests and such as are banished to that quarter of the world. The Portuguese have instructed and civilized many of the blacks and molattoes in their African settlements, so that, besides priests of a dark complexion, who are often men of letters, well versed in the Latin, Greek, and French languages, they have their principal factors, and many rich merchants, lawyers, surgeons and others, of the same colour: all of these prove as faithful and good subjects, to the crown of Portugal, as any in Lisbon.

It is remarkable, that the most healthy part on this coast remains, at this day, unpossessed by any European nation, the Banana

 islands:

iſlands: theſe lie at a ſmall diſtance from Sierra Leon: and according to the accounts I have had of the healthy temperature of the air, which would ſtill be improved by cultivation, it is probable, that Europeans might reſide in them with tolerable ſafety, during all the ſeaſons of the year. Should the head quarters, of our military eſtabliſhments in Africa, be removed from Senegal and Gambia, into theſe iſlands; and ſhould they be made a privileged center of commerce, and a ſtorehouſe for trade; all the other ſettlements and out-poſts of the army, might, from thence, with ſafety, be viſited by the proper officers, and merchants, during the dry ſeaſon of the year.

In order to recruit unhealthy military poſts, where it may be requiſite to keep ſoldiers the whole year, it might, perhaps, be adviſeable, that criminals be condemned to ſerve there for life, or for a limited term of years; and the puniſhment of deſertion in the army, might, in ſome caſes, be converted into that of baniſhment to thoſe ſettlements.

It is ſaid the King of Pruſſia ſeldom puts a ſoldier to death; but, according to the

nature of the crime condemns him, for a longer or fhorter time, to work upon the fortifications; and thus renders him ftill an ufeful fubject.

The Spaniards feldom fend regiments to unwholefome places; fuch they generally garrifon with exiles.

The annual lofs fuftained by the Dutch troops at Batavia is chiefly fupplied by a number of idle and diforderly perfons, picked up or trepanned in the ftreets of Amfterdam, efpecially foreigners and deferters from different nations. Thefe recruits, yearly embarking in the Dutch Eaft-India fhips, are a mixed company of different European nations, and do not, like the Englifh regiments, confift chiefly of their own fubjects, often ingenious mechanics and ufeful tradefmen.

If the Englifh were thus to fend deferters and criminals to the unhealthy places on the coaft of Guinea, it would tend to preferve a number of ufeful fubjects, and render fuch lives, as are forfeited by law, ftill beneficial to their country. It might ferve likewife to wipe off the afperfion of foreigners, which we hope is unjuft, that there are often more

people executed in England, in one year, than on the whole continent of Europe.

It is a melancholy, but a certain truth, that the maintenance of a military eſtabliſhment at Senegal for three years, during war, was formerly attended with an annual loſs of above a thouſand lives; and ſince the re-eſtabliſhment of a military government there, the mortality has been very conſiderable. Moſt of the officers and ſoldiers who embarked for that part of the world, died; and the governor, with the poor remains of his corps, may be ſaid to have lived chiefly by repeated doſes of the Peruvian bark.

I cannot help further obſerving, that the warm woollen clothes, and the black hat, which conſtitute the regimental dreſs of an Engliſh ſoldier, are altogether improper in hot climates. In thoſe countries, ſoldiers, during fatiguing marches, while ſweating under the oppreſſive load of arms and warm clothing, are apt, in the heat of the day, to be ſuddenly ſeized with a ſpecies of apoplexy. This is occaſioned by the ſcorching beams of the ſun darted on the head, and abſorbed by the blackneſs of the hat; and, to prevent it, a white covering for that part

ſeems

seems requisite. To recover the patient from this fit, immediate bleeding is requisite; notwithstanding which, many die, and others remain deprived of their senses ever afterwards.

It may not be improper to subjoin a few directions for the preservation of the numerous subjects of Great Britain, particularly the soldiers, who are yearly sent to India.

As most of the ships, who perform this voyage, are either newly built, or have been for some months unemployed, without fires or people on board, they become unwholesome. It would therefore be adviseable, in East-India ships, before they are fitted out, to keep constant fires of dried wood for six or eight hours every day, during a fortnight or three weeks. To evince the propriety of this advice, if by way of experiment, a fire be made on the ballast, and the hatches shut, the smoke, which issues from the crevices, will be found to have an intolerable stench, proceeding entirely from the unwholesome dampness of the timbers.

To prevent infection, every recruit or soldier, when first sent on hoard, should be stripped

ſtripped of his old clothes or rags, before he is permitted to go between decks.

During ſo long a voyage, a ſufficient ſtock of clothes, with changes of linen, and particularly a good bed, are abſolutely neceſſary. When a number of ſuch people are ſent on board, ſuch of them as, not having a bed to lie upon, are obliged to ſleep in their dirty clothes on the decks, or on cheſts, will be ſeized with frequent chills, reſembling the fit of an ague, and afterwards have an head-ach, great thirſt, and heat on the ſkin, which may ſometimes be attended with a cough, pains of the limbs, or other accidental ſymptoms.

Theſe are the firſt appearances of that infectious fever, which often, in a greater or leſs degree, annoys ſhips crouded with ſoldiers. Some in the progreſs of the diſorder will become yellow, others have ſpots on their bodies; but the head being greatly affected, and the low fever, clearly evince the nature of their diſeaſe.

As nothing will more effectually prevent this infection, than a ſufficient ſtock of good clothes and bedding for each man on board; ſo,

so, on the other hand, nothing will abate its progress so much as carrying out a supernumerary quantity of beds, linen, and clothes, for shifting the men. On the first appearance of this fever, and of the head being affected, the application of a blister almost certainly removes it; but from filth and dirt, the most efficacious remedies will be rendered ineffectual.

We have further to recommend, in East India ships, the same supply of necessaries for the sick, as is granted in the royal navy. A man in a fever cannot live on buiscuit and salt beef. Barley, rice, currants, sago, sugar, spices, and even wine, seem essentially requisite for the perfect re-establishment of his health.

If ships, in their passage to India, touch at the islands of St. Jago, Madagascar, St. Johanna or Mohilla, at Culpee in the River Hughly, Batavia, or Bencoolen, those persons who go ashore should always return before night; as these places have proved particularly fatal to Europeans, who sleep on shore, at particular months of the year: and, in all unhealthy places, when the ship lies near the land, for the preservation of the men,

man, a fire ſhould be kept burning on the forecaſtle all night, and the ſhip have her awnings ſpread in ſuch a manner, that the influence of the fire and ſmoke may extend themſelves over the whole ſhip *.

If the ſoldiers be landed at Calcutta, they may be firſt ſtationed on the high grounds in its neighbourhood, until ſeaſoned to the country.

But if the men have been very ſickly during the voyage, it is adviſable to keep them ſeparate for ſome time, from other perſons, till perfectly recovered, and free from infection: a precaution we would recommend to all our factories abroad; from a neglect of which ſeveral of them have ſuffered.

* Further directions, on this head, may be ſeen in my Eſſay on preſerving Seamen.

END OF PART II.

PART III.

Advice to Europeans in Cafes of Sicknefs in hot Climates.

CHAP. I.

Directions for the Cure of thofe Difeafes which attack Europeans in hot Climates.

SECT. I.

Fevers.

IN addition to what is faid in the Appendix to the Effay on preferving Seamen, and to the forms of medicines given in the latter editions of that work, I fhall here fubjoin fome further directions and prefcriptions, for the cure of thofe difeafes which are moft incident to Europeans in hot climates.

When a perfon, upon his firft arrival in the Weft Indies, or any other country between the tropics, is attacked with a fever,

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no phyſician can tell what ſymptoms may occur in its progreſs; however mild it may appear in the beginning, yet it will often afterwards be attended with diſcharges of bile, with a jaundice, or with ſymptoms of the moſt malignant nature. It is therefore always neceſſary, eſpecially during a ſeaſon of prevailing ſickneſs, to endeavour, by the moſt efficacious means, to bring the fever as ſoon as poſſible to a remiſſion, that the bark may be adminiſtered without delay.

It is to be conſidered how far the violence of the fever, in its firſt attack, will admit of bleeding*: a few ounces of blood, taken from the foot, have ſometimes been found to relieve the pain of the head: but bleeding is in general to be uſed with great caution, and the repetition of it with ſtill greater, in thoſe climates.

The chief objects of attention in all ſuch fevers, are the contents of the ſtomach and inteſtines. Immediately upon the patient's firſt complaint, and during the firſt hours of the fever, while perhaps he is only chilly, or complains of alternate fits of heat and

* See Appendix to the Eſſay on preſerving Seamen.

cold,

cold, the ſtomach and inteſtines ſhould be cleanſed, either by a vomit, by a purge of manna with tincture of ſenna, or by an oily and purging clyſter.

The patient, immediately after cleanſing the ſtomach and inteſtines, eſpecially if the ſkin be moiſt, ſhould take an antimonial draught*; which ſhould be repeated every ſix hours. According to the ſtate of the ſtomach, the doſe of the antimonial medicine ſhould be increaſed or diminiſhed; taking care that it does not irritate or offend the ſtomach; to prevent which, eſpecially if there be a tendency to vomiting, a few drops of tinctura thebaica muſt be added. If the irritation be violent, the antimonial may be omitted, and the opiate given in a full doſe.

* Recipe Salis cornu cervi ſemi ſcrupulum, ſucci limonum drachmas tres, vel q. ſ. ad ſaturationem; aquæ menthæ vulgaris ſimplicis drachmas decem, tincturæ ſtomachicæ drachmam unam, vini antimonialis guttas x. ad xl. (vel potius in vicem vini antimonialis, tartari emetici quartam partem grani) ſyrupi è corticibus aurantiorum, drachmam unam, miſceantur.

If the volatile alkali, though combined with the acid of lemons, be thought to decompoſe the antimonial preparation; the Vinum Antimoniale, or Tartarum Emeticum, may be exhibited without either an acid or alkali in the preſcription.

If the antimonial medicines, after thoroughly cleanſing the bowels, produce a ſweat, the patient will probably have an intermiſſion of the fever, or at leaſt a mitigation of its ſymptoms, in 24 hours. The bark is then, if no ſymptom forbids, immediately to be given.

The next day, a return of the fever is to be expected, unleſs a ſufficient quantity of bark has been taken. In this caſe the antimonial medicines are to be repeated, during the continuance of the fever: and if the head-ach be violent, or the patient be threatened either with a delirium or coma, a Bliſter ſhould be applied to the back. Recourſe muſt be again had to the bark, as ſoon as the fever leaves the patient; and to that medicine, if he is much weakened by the preceding fits, ſome ſnake-root or camphire may be added.

If the antimonial medicines have not cauſed plentiful diſcharges by ſtool, as they often cauſe, a purge, combined with the bark *, may be given occaſionally, in the

* Recipe corticis Peruviani parùm contuſi ſeſquidrachmam, aquæ libram unam, coquantur ad colaturæ uncias tres, cui adde ſalis cathartici amari drachmas ſex, tincturæ corticis Peruviani ſimplicis drachmas tres.

abſence

abſence of the fever; copious bilious ſtools proving frequently critical and ſalutary.

Having made frequent mention of the virtue of antimonial medicines in fevers, in this and my former writings, I ſhall here take the opportunity of delivering my ſentiments fully upon them.

Antimony appears to poſſeſs a virtue eminently febrifuge, which it frequently exerts independent of any evacuation.

The uncertain operation of antimonials, and the profuſe evacuations which they have been, in ſome caſes, known to produce, have been urged as objections againſt their uſe in fevers; but ſuch objections ariſe merely from an injudicious adminiſtration of the medicine, or from an ignorance of the proper method of managing it.

Large doſes of antimonials, or even ſmaller ones too frequently repeated, have ſometimes brought on evacuations, which have ſunk the patient: it is therefore always adviſeable to begin with a ſmall doſe, in order firſt to judge of its effects on the conſtitution.

Should antimonials, notwithſtanding this precaution, prove unexpectedly violent in

their operation, opium will always effectually check them. The opiate may be given either alone, to reſtrain evacuations already too violent, or it may be combined with the antimonial to prevent them. An antimonial thus guarded, may be adminiſtered with ſucceſs even in fevers attended with a purging. An opiate, given after the too ſevere operation of an antimonial, checks all further evacuation, recruits the patient's exhauſted ſtrength, and in ſuch a caſe ſeems requiſite to the entire removal of the fever; it allays the febrile anxiety, and brings on a ſtate of perfect eaſe, without which the ſucceſs of antimony would not be complete.

Some preparations of antimony contain this febrifuge virtue in a high degree, as Tartarum Emeticum, and Dr. James's powder. Others contain it in a leſs degree, as vinum antimoniale.

By an order from the admiralty, the navy of England, and the naval hoſpitals, were ſupplied with a medicine, called Doctor James's Fever Powder; with inſtructions to obſerve and report the effects of it in fevers. In conſequence of that order, this powder has been given at Haſlar Hoſpital, in vari-

ous cases of fevers, to several thousand patients. A third or fourth part of the powder contained in one paper was commonly prescribed at first, and repeated every four hours. When the whole quantity in a paper, which varies in weight from 24 to 30 grains, had been thus administered, without producing any sensible effect, half a paper was given in one dose, and repeated every six or eight hours. After which, if the patient still remained costive, and it was judged that stools would be useful, a whole paper was administered at once: that quantity having been frequently found a mild and efficacious purge, even after the recess of the fever. If the patient could swallow a bolus, this powder was mixed with conserva fructus cynosbati, except when there was a diarrhœa, or too frequent stools; in which case it was administered in philonium Londinense. When there was a subsultus tendinum, four or five grains of camphire were added to the powder; and other medicines occasionally. This powder was given with most success, when the head was affected with violent pain, or stupor, and often when the patient was delirious or comatose, or

both; in which laſt ſtate, after he had continued ſeveral days, there were many inſtances of an apparent and ſalutary effect from this medicine, even when it acted merely as an alterative. It is however to be obſerved, that when this powder was given, nothing had been omitted, on account of its adminiſtration, which could promiſe relief or ſafety to the patient; bleeding, bliſtering, and all other requiſite evacuations were uſed, as if no ſuch powder had been given. But as fevers differ much in their nature, one remedy, or one powder, cannot be univerſally ſucceſsful in all fevers: bleeding is known to be of great benefit in ſome, and opium, it will ſoon be ſhewn *, is of equal benefit in others; yet the effects of bleeding and opium are ſo entirely oppoſite to each other, that the miſtake of applying one of thoſe remedies where the other is proper, muſt be attended with bad conſequences: in the ſame manner, the promiſcuous uſe of this powder, in the hands of the ignorant, will render it doubtful, whether ſuch a remedy would do moſt good or harm: and phyſi-

* See the Appendix.

cians

cians ſeldom venture to preſcribe a medicine of a compoſition unknown to them, being thereby leſs able to correct any bad ſymptom which might accidentally proceed from its uſe. So upon the whole, this medicine, until made public, is not likely to be of general benefit to mankind. The tartarum emeticum, from repeated trials, I find to be poſſeſſed of a virtue ſimilar to that of Dr. James's powder. Like that powder, it requires alſo to be occaſionally compounded with other medicines, with camphire or nitre, to improve its efficacy, or with opiates, to prevent its irritation of the ſtomach and bowels. Half a grain * of it will be quite ſufficient for the firſt doſe, which may be repeated every ſix hours; and, to produce evacuations, may be occaſionally increaſed.

The Vinum Antimoniale, upon ſeveral comparative trials, I have found to be poſſeſſed of a leſs degree of febrifuge virtue than the tartar emetic. I have however ſome-

* Recipe Aquæ Alexiteriæ ſimplicis drachmas decem, Aquæ Alexiteriæ Spirituoſæ, Syrupi e Corticibus Aurantiorum, ſingulorum drachmam unam, Tartari Emetici granum dimidium. Miſce. Fiat hauſtus, cui pro re nata adde Nitri grana tria.

times prefcribed with fuccefs the vinum antimoniale in large quantities, when a patient in a fever had continued for feveral days in a doubtful ftate of recovery, comatofe, and infenfible, with a continual ftupor on the brain, and a violent ftruggle and oppreffion of the vital organs. In this cafe, I give a drachm of it diluted with water, and repeat it every two hours, with the increafe of half that quantity, until an ounce is taken, or fome fenfible effect produced. If it brings an inclination to vomit, this evacuation fhould be promoted by drinking warm water; and if there be a tendency to a loofenefs, forty drops of the tinctura thebaica fhould be added to each ounce of the wine.

As to other antimonial medicines, fuch as the kermes mineral, fo much ufed in France, and the antimonium diaphoreticum, I have had very little experience of their effects.

A caution is requifite, to avoid the addition of an alkali to an antimonial preparation, as it would decompofe the antimony in moft of its preparations commonly ufed: hence the teftaceous powders, frequently combined with tartarum emeticum, would feem to impair the efficacy of the medicine. Let me add,

add, that antimonial medicines being of importance, ought to be prepared with the greateſt exactneſs, and uſed when newly made, as long keeping or an expoſition to the air greatly injures their vir tues

These are the moſt proper methods of treating of Europeans, upon the firſt attack of this fever in a warm climate, that a perfect intermiſſion, the moſt deſirable criſis, may be obtained; when the bark may be ſafely and plentifully adminiſtered.

But on the other hand, if the patient, upon being firſt ſeized, makes no complaint of his indiſpoſition; if, as is too often the caſe, he ſuppoſes it ſolely the effect of drunkenneſs, debauchery, or intemperance, or aſcribes it to hard labour or violent exerciſe when expoſed to the heat of the ſun, and thence for ſome days neglects to make his condition known, until a yellow colour ſhews itſelf in the eyes, his caſe is already become extremely dangerous. The anxietas febrilis, or a great oppreſſion, with the ſenſation of heat and pain at the pit of the ſtomach, come on, and frequently precede copious diſcharges of bile, by vomit or by ſtool: they are alſo the forerunners of a jaundice. Sometimes the region

region of the liver becomes ſwelled, hard, and painful. Strong and conſtant convulſions of the diaphragm, intercoſtal muſcles and ſtomach, follow theſe ſymptoms, and are accompanied with a vomiting at firſt of green offenſive bile, and afterwards of black diſſolved blood, reſembling the grounds of coffee, which is ſucceeded by bleeding at different parts of the body, a phrenzy, an univerſal gangrene, and death.

Inſtead of giving a particular deſcription of this fever, we ſhall refer to the accounts already given of it in ſeveral parts of this work, and to thoſe of Dr. Robertſon, Dr. Lind of Windſor, and Dr. Rouppe*; where the appearances of this fever are deſcribed as it occurs on the coaſt of Guinea, in the Eaſt Indies and in the Weſt. We will farther ſubjoin an original account of the yellow fever, drawn up by Dr. Bruce, a native of Barbadoes, and a phyſician who long practiſed in that iſland †.

As

* See chap. i. ſect. 2. chap. iii. ſect. 2. and chap. iv. ſect. 2. of part i.

† Account of the yellow fever by Dr. Bruce.

" Febris putrida, apud Noſtrates dicta flava, quoniam plerumque,

As to the prognoſtics, if a jaundice makes its appearance ſoon, it is a bad ſymptom. Livid

plerumque, ſub finem morbi, cutis flavedine ſuffunditur, ab Hiſpanis Vomino preto, et a Gallis Maladie de Siam vari nominatur. Advenas ex climate temperato in Indiam utramque corripit, et eos, qui poſt labores diuturnos et exercitium vehemens, ſub ſolis ardoribus ſeroribus nocturnis exponunt: adjecto præſertim liquorum, ut dicunt ſpirituoſorum abuſu. . . . In omni anni tempeſtate, ſeſe offert hic morbus; ſymptomata autem graviora obſervantur, ubi calor magnus cum multa humiditate conjungitur.

"Incipiens dignoſcitur languore, dein nauſea quadam, et vertigine; paulo poſt accedunt algor et horripulatio, perraro tamen rigor: quos excipiunt ardor vehemens, et intenſa febris, cum ſummo capitis et lumborum dolore: rubet os totum, ardentque oculi; quæ ſigna, adjecta anxietate et præcordiorum oppreſſione, pathognomonica dicuntur. Pulſus adeſt velox, eltus, quandoque pulſitans, ſed mollis; in quibuſdam velociſſimus, et plenus, cum reſpirandi difficultate. Cutis aliquando ſicca eſt, in primis præſertim morbi diebus, ſed frequenter magis rorida. Sanguis etiam ingruenti morbo miſſus, colorem exhibit floridum, rutilum, et quaſi rarefactum, craſſamento vix cohærente, ſero luteo croceo: Flaveſcit urina. Somnus parvus eſt, abſque levamine; jactatio frequens. Sitis in quibuſdam ſumma eſt, vix adeo in aliis magna. Lingua in principio muco albeſcenti obducta, ſqualeſcit circa finem morbi, et in media ſcabra, coloris primum rufi, dein quaſi nigreſcentis, horrida apparet. Perſiſtunt hæc ad diem tertium, aliquando quartum

Livid ſpots, which ſometimes ſhew themſeves, portend death. If the ſkin continues

quartum et ulterius. Cum vero cauſæ antecedentes acerrimæ ſint, labefactuntur ægri vires, et intra viginti quatuor horas, vel citius moritur. Quo citius his, primus abſolvitur gradus, eo malignior ſolet eſſe morbus.

"Tertiam vel quartam cerciter diem deficit pulſus, ſitque lentus, etiam ſolito magis, adeo ut abſenti inſuper cutis ardore, omnia in vado eſſe jactent indocti; falſa tamen ſpe tenentur, nam cito poſt omnia in pejus ruunt. Invadit coma, cum deliriis interruptis; vomitus porraceus, ſudor gelidus, et deliquia; oculorum rubor in colorem fuſcum mutatus, ad flavum accedit; ſic et circa os, tempora, collum, dein per totum corpus flavedo hæcce diffunditur; mali ominis ſigna; ecce enim coma altum, pulſus vermicularis et intermittens, hæmorrhagiæ, reſpirandi ſumma difficultas, jactatio perpetua, ſubſultus tendinum, extremorum frigus, convulſio, mors . . . . Obſervatu dignum eſt, hanc cutis flavedinem in quibuſdam obrepiſſe poſt ſeptimam et ultra diem; tumque vix adeo mali ominis eſſe. . . . . Hæmorrhagiæ variis e corpore locis proveniunt; e naribus ſcilicet, ore, oculis, atque cutis poris; ſanguis per ſedes ejicitur, quaſi niger, ſic et vomitu. Urina icterica, nigreſcens. Apparent notæ lividæ, et in membris gangrenæ. Poſt mortem corpus livet, juxta præſertim præcordia, quæ in principio ſedes eſſe morbi videbantur, hepar ſcilicit et ventriculus: in putredinem poſt hæc omnia rapiuntur.

"Exſurgunt indicationes.

"imo,

nues very dry and rough, the caſe is dangerous; and the longer it continues in that ſtate,

" 1mo, Ut magnus et rapidus fluidorum motus, cum febris violentia minuatur, in primo morbi gradu.

" 2do, Ut e corpore eluatur putrida quævis materia, ſic ut putreſcens humorum diſpoſitio precaveatur, in omnibus morbi gradibus.

" In incipiente igitur febre, quoniam plerumque pulſus velox et plenus ſit, mittatur ſanguis, pro ratione virium et ætatis: repetita perraro juvat miſſio. Si vero pulſus adſit debilis incipiente morbo, vix detrahendus eſt latex vitalis.

" Cum ad ſecundam indicationem acceditur, caute procedendum eſt. Ventriculus enim inflammatus, vel ſumme irritabilis, ſæpe leniſſima ægre fert medicamina: qua re emetica minime exhibeantur, niſi perpetuam vomitionem inducere velis, et gangrænam: præterea morbi fomes in inteſtinis, ſive in hepate ad ductus biliarios inhæreſcens, multo magis feliciter catharticis lenioribus educitur. Æger, ſi adſtringatur alvus, quod in principio ſæpe fit, eccoprotica ſtatim adeat, qualia ſint decoctum tamarindorum et chryſtalla tartari. Si his non auſcultet venter, auxilio detur enema quoddam emolliens et catharticum. Sæpe tamen cum eveniat in primis morbi diebus, ut quæcunque cathartica, quamvis leniſſima, ventriculo rejiciantur, fugiendum hoc in caſu ſemper eſt ad enemata fortiora, donec probe ſoluta ſit alvus: poſtea remanente adhuc nauſea, vel quidem auctis vomendi conatibus, præcipiatur extracti thebaici granum, vel grana duo, ſub pilulæ forma. Hac ratione, uſu ſcilicet enematum et opiatorum, trucem hunc morbum, haud ſemel in praxi debellavimus.

" Tertium

ſtate, the greater is the danger; ſuch patients ſeldom recover, though the pulſe may

" Tertium circiter diem, labitur pulſus, &c. fortiter nunc robur eſt ſuſtinendum, medicamentis cardiacis, victuque idoneo, levi, et eupeptico.

" Cortex Peruvianus magni foret hic uſus, niſi nauſeam moveret, vires tamen in quibuſdam experti ſumus, ubi aderant hæmorrhagiæ, et alia ſummæ putredinis indicia, ſed levis quidem in vomitus propenſio.

" Camphora, quæ in febribus putridis, lentis, optimum remedium eſt, huic non multum opitulatur: plerumque enim nauſeam movet, quandoque tamen profuiſſe læti obſervavimus.

" Radix ſerpentariæ Virginianæ, valde antiſeptica eſt, et fere ſemper levaminis multum ventriculi ægritudinibus adferre ſolet; leve autem adſit infuſum. Recipe radicis ſerpentariæ Virginianæ drachmas duas; infunde in aquæ bullientis libra; colaturæ adde elixiris vitrioli quantum ſufficit ad gratam aciditatem, et dentur cochlearia duo vel tria ſæpiſſime. Infuſo huic immiſceatur vinum Madeirenſe pro re nata.

" Præſcriptis omnibus ad ventriculum roborandum fruſtra tentatis, ſpes ægri julepo ſequenti reſtoravimus. Recipe aquæ menthæ ſimplicis & tincturæ ſtomachicæ partes æquales. Sumat cochlearia duo vel tria quaque hora, vel ſemi-hora.

" Perſiſtente adhuc nauſea, recurrendum abſque mora eſt ad extractum thebaicum (poſt ſedatum ventriculum exhibeatur enema catharticum) cui medicaminis generi fere ſemper hoc in morbo plurimum inſiſtendum eſt; ſic enim feliciter deorſum elicitur morbi fomes, atque materia

may give hopes, and the other ſymptoms alſo be flattering. Many have a good pulſe in

teria feculina putreſcens; ventriculuſque levatvs diætæ dein, et medicinæ, auſcultat.

" Diæta ſit levis, ex vegetabilibus antiſepticis deprompta; minime vero ex animalibus, quæ ad putredinem propius accedunt. Sit potus acidulus. Decocta, vel infuſa panis toſti in aqua, cum ſucco limonum vel tamarindorum, juvant, adjecto, ubi langueant vires, vini pauxillo. In vinis primum locum tenent Madeirenſe et Rhenanum. Hæc et potui eſculentiſque immiſta, parca ſimul copia, ſed ſæpiſſime dentur.

" In ultimis morbi diebus, cum ſumme langueant ægri vires, adſitque extremorum frigus, aliaque mali ominis indicia, augeantur adhuc medicamenta cardiaca. Recipe radicis ſerpentariæ Virginianæ drachmas duas, croci Anglicani ſemidrachmam, infunde in aquæ bullientis quantum ſufficit ad colaturæ uncias ſex; Adde vini Madeirenſis uncias quatuor, tincturæ ſtomachicæ uncias duas, dein miſceantur. Capiat cochlearia duo vel tria ſingulus quibuſque horis. Huic pro re nata addantur confectio cardiaca, vinum croceum, camphora, tinctura corticis Peruviani. Abſint, quæcunque ſanguinem ſolvunt, quamvis cardiaca dicta, quales ſunt ſales volatiles, et ſpiritus cornu cervi vel ammoniaci, neque extremis admoveantur epiſpaſtica, quia ſanguinem mire ſolvunt, hæmorrhagias atque gangrænam ferunt.

" Præter ſalutifera dicta, in quibuſdam opus eſt nervinis, ubi nimirum ex ſumma materiæ morboſæ acrimonia fit nervorum diſtentio, urgentque ſpaſmi, cum ſingultu,

in this fever even a few hours before death. If the vomiting is constant, if what is thrown up turns to a dark colour, and the patient hiccups often, the case is almost desperate. If the face be greatly flushed, the vessels of the tunica adnata become red as in an opthalmia, and there be a phrenzy,

singultu, hoc in casu, nulla, moscho et castoreo cum opio, præstantiora.

"Sub finem morbi, prægressis dissoluti sanguinis notis, pacata postquam visa fuissent symptomata graviora, vomitus quandoque ex inopino recrudescit; et miseros diarrhœa biliosa stipatos ad orci fauces pellit; quosdam vero feliciter servatos novimus hac ratione. Recipe corticis Peruviani contusi semunciam; coque in aquæ fontanæ unciis duodecim; sub finem coctionis adde radicis serpentariæ Virginianæ florum chamœmeli, singulorum drachmas duas; fiant unciæ sex colaturæ; cui adjicer balsami sulphuris terebinthinati guttas quinquaginta, tincturæ thebaicæ guttas octoginta; gelatinæ amyli uncias duas; misce, fiat enema statim injiciendum, et diu retinendum. Si vero enema antisepticum et anodynum fortiter minus opituletur, præscripta simul est in quibusdam pilula sequens. Recipe extracti corticis Peruviani grana quatuor, camphoræ, extracti thebaici, singulorum granum unum. Misceantur. Fiat pilula secundis vel tertiis quibusque horis sumenda, donec sistantur paululum motus ventriculi et intestinorum.—Enematis ejusdem et pilulæ vires, in dysenteria putrida, adstante jam sphacelo, haud semel experti sumus."

the

the patient will die in a very ſhort time, eſpecially if the ſkin be dry.

On the other hand, if the head continues unaffected; the pulſe becomes ſoft; the pains, oppreſſion on the breaſt, and reaching be ſomewhat abated, by bleeding or other means; if the irritation of the ſtomach be removed by gentle purging, and the ſkin is ſoft and moiſt; if the patient becomes compoſed, and is relieved from that oppreſſion of ſpirits, which before diſtreſſed him; it is probable that he will recover; all theſe being ſalutary appearances.

As to a criſis of the fever, it may happen in different ways, without any reſpect to the critical days enumerated by the ancients. It ſometimes happens by ſweat. But the moſt favourable and certain, being the beſt termination of all fevers of this ſort, is when it terminates in an eruption of ſmall boils on the ſurface of the body. A diarrhœa proves alſo a favourable criſis. A bleeding from the noſe, or from an artery, in the beginning of the fever, has ſometimes ſaved the patient's life: but hæmorrhages, when profuſe, or happening towards

the end of the diſeaſe, are fatal. Buboes, and a ſwelling of the parotid glands, are unuſual, though ſalutary ſymptoms.

Would the potio frigida, ſo much recommended by the ancient phyſicians, and adminiſtered in fevers by many of the moderns in different parts of Europe, be ſerviceable in this diſeaſe?

In the neighbourhood of unwholeſome, damp, and woody places, during hot weather, a fever often makes its attack with a delirium. In this caſe, after bleeding, if indicated, antimonial medicines and bliſters are chiefly to be depended upon; together with the immediate removal of the ſick into a purer air. At the ſame time nitre may be given in large doſes well diluted; or, if that be nauſeated by the patient, the ſpiritus nitri dulcis *, which will be found to ſit eaſier on the ſtomach, and the nitre † may be adminiſtered in clyſters.

* Recipe Aq. alexiteriæ ſimpl. drach. vi. aq. alexiteriæ ſpir. drach. i. ſucci limon. (ſale abſinthii ſaturati) drach. iij. ſpir. nitri dulcis drach. i. ſyr. ſimpl. drach. ij. M. fiat hauſtus quarta quaque hora ſumendus.

† Recipe Aq. hordeatæ unc. x. nitri ʒ ſs, albumen ovi unius M. fiat enema bis terve de die injiciendum.

The

The feet ſhould be frequently bathed or fomented with warm water, and ſinapiſms * applied to them, if the caſe is obſtinate.

In caſes of violent delirium, eſpecially if attended with convulſive twitchings, muſk † alone, or with cinnabar, is proper. If there be worms in the ſtomach or inteſtines, 10 or 15 grains of calomel may ſafely be given. Towards the end of the fever, when a conſtant inquietude and long want of ſleep diſtreſs the patient, ſoporific medicines are beneficial.

* Recipe Farinæ avenaceæ et pulv. ſinapios partes æquales, aceti q. ſ. M. fiat cataplaſma pro pedibus.

† Recipe Moſchi gr. x. ad xv. ſacchari albi drach. i. terantur ſimul in mortario, dein adde mucilag. gummi Arabici ſcrup. iv. aq. fontanæ drach. xiv. aq. alexiteriæ ſpir. drach. ij. M. fiat hauſtus ſexta quaque hora ſumendus.

Recipe Cinnabaris gr. xij. confect. cardiacæ q. ſ. fiat bolus ſextis horis ſumendus, cum hauſtu moſchato ſuprapræſcripto.

Recipe Capitum papaverum alborum drach. vi. coquantur ex aquæ font. lib. ij. ad dimidiam, addendo ſub finem coctaræ rad. ſerpentariæ Virginianæ contuſæ, rad. contrayervæ, āā drach. ij. coletur liquor fortiter exprimendo, poſtquam refrixerit; et dentur unc. ij. omni quadrihorio, additis nonnunquam elixir paregorici gutt. x.

Leeches applied to the temples, and cupping-glaſſes to the nape of the neck, have alſo proved ſerviceable.

Cream of tartar, diſſolved in boiling water, makes an excellent cooling drink in theſe fevers; to which manna and ſugar may be occaſionally added.

If there appears a ſwelling of the parotid gland, the ſuppuration of it ſhould be promoted by poultices, and the patient's ſtrength ſupported by wine.

SECT. II.

The Dyſentery and Cholera Morbus *.

THE Dyſentery is alſo a diſeaſe to which Europeans are very ſubject in hot climates. We indeed meet with few inſtances of an epidemical malignant fever, which is not in ſome caſes accompanied with a flux.

The flux ſometimes appears by itſelf,

* This diſeaſe in the Eaſt Indies, where it is very frequent and fatal, is called the Mordechin.

often

often uſhers in the fever, more frequently accompanies it. When alone, it is generally milder, and leſs mortal than when attended with fever. A neceſſary diſtinction to be made between fluxes in all climates is, that thoſe which attack perſons in perfect health may be conſidered as original diſeaſes; and thoſe which attack perſons much weakened by a fever, or otherwiſe reduced to a very low condition of body, are properly ſymptomatic, proceeding chiefly from weakneſs, of which the flux is equally a ſymptom and a proof.

When a violent dyſentery ſeizes a perſon in health during warm weather, the following are the moſt proper means of relief. Bleeding ſhould firſt be uſed, with great caution; a few grains of ipecacoanha be given to operate as a vomit, and an opiate after its operation; a full doſe of ſal catharticum amarum be adminiſtered, to cleanſe the inteſtines; and afterwards recourſe be had to ipecacoanha, in very ſmall doſes, with opiates and rhubarb: When the pain in the bowels and fever are gone, and the purging much abated, the cold bath will contribute greatly towards a perfect re-eſta-

bliſhment of health. Sometimes at the beginning of this diſeaſe, eſpecially when accompanied with fever, relief has been obtained from diſſolving an ounce of manna and two grains of tartar emetic in a pint of common emulſion, with the addition of half an ounce of ſyrup of white poppies; and giving an ounce of the mixture every hour, until the bowels were ſufficiently emptied; after which an opiate was given; and then a mixture of the bark with opium, to complete the cure.

But when the patient is ſeized with a cholera morbus, when the dyſentery on its firſt attack is accompanied with violent reachings or a ſevere vomiting, other medicines muſt be preſcribed. In the firſt place, the ſtomach muſt be evacuated of its contents by for a ſhort time promoting the vomiting with diluent drink and ſome very gentle ſtimulus, as by large draughts of a weak decoction of chamomile flowers, or by warm water, with the addition of a few drops of ſpirits of hartſhorn, which tends to remove the cramps and ſpaſms, with which the patient at ſuch times is often diſtreſſed. The decoctum chamœmeli muſt be adminiſ-

tered

tered in clyſters, until the inteſtines be likewiſe perfectly cleanſed. After theſe an opiate * muſt immediately be given. If the opium be vomited up, it muſt be given by way of clyſter in double the quantity, with four or five ounces of warm water. It is to be repeated at an interval of ſix or eight hours.

When theſe methods have failed to ſtop the vomiting, I have often found ſucceſs from the external application to the ſtomach of warm wine and ſpices, or of opium and camphire †.

A drop of the oil of cinnamon taken upon a piece of ſugar, muſk, mint, ſometimes elixir

* ℞ Salis abſinthii ſcrup. i. ſucci limon. unc. ſs. vel q. ſ. ad ſaturationem, aq. menthæ vulg. ſimp. drach. x. aq. menthæ vulg. ſpir. drach. ij. ſyrupi papav. alb. drach. i. tinct. thebaicæ gutt. xxx. M. Vel ℞ Opii puri gr. i. olei menthæ piper. eſſential. gutt. i. M. fiat pilula.

† ℞ Linimenti ſaponacei drach. vi. tincturæ thebaicæ drach. ii. Miſce.

℞ Camphoræ (olei olivar. unc. ij. ſolutæ) unc. i. tincturæ thebaicæ unc. ſs. Miſce.

℞ Emplaſtri è cymino unc. i. ſs. opii drach. ſs. camphoræ, drach. i. olei eſſentialis menthæ vulgaris, gutt. x. olei macis per expreſſionem q. ſ. ut fiat emplaſtrum molle, regioni ventriculi applicandum.

vitrioli and ſpiritus nitri dulcis, are the moſt proper internal medicines to ſtop the vomiting after the inteſtines are cleanſed. The patient ſhould be allowed for drink, mint-tea, toaſt and water, almond-emulſion, or ſometimes chicken-broth. But if the vomiting continues for ſome time to be very obſtinate, and the bowels be ſufficiently cleanſed, the ſafety of the patient will entirely depend on bathing the ſtomach well with opiates and camphire, and on adminiſtering tinctura thebaica in clyſters; theſe clyſters ſhould be repeated with an increaſe of the opiate every ſix hours, until the vomiting and pains ceaſe, or the patient's head be affected by it. In obſtinate and dangerous caſes, I have ſometimes been obliged to increaſe the quantity of tinctura thebaica to half an ounce in the clyſter, before the ſpaſms could be removed. But previous to giving opium in ſo large a quantity, I generally ordered the feet to be bathed, and applied bliſters to the legs; or if a violent and fixed pain in the ſtomach, or in any part of the abdomen, had continued from the beginning of the diſeaſe, and was not removed

by

by bleeding and warm fomentations, I then applied a bliſter to the ſeat of that pain.

In both dyſentery and cholera morbus, when the whole abdomen is hard, tenſe, and painful, immediate eaſe is often procured by fomenting it with a decoction of chamomile and elder flowers, together with ſome heads of white poppies, ſprinkling the flannels dipt in the fomentation with camphorated ſpirit of wine, immediately before they are applied.

In ſome dyſenteric caſes, opium proves moſt effectual when given by the mouth, in others when in clyſters.

For other anti-dyſenteric medicines, ſee Formulæ Medicamentorum, annexed to my Eſſay on preſerving Seamen.

SECT.

SECT. III.

The Dry Belly-ache.

THE principal relief in this painful diſeaſe is to be expected from perſiſting in the uſe of opium, both by clyſters*, and by embrocations † on the belly, until the ſpaſms and pain are ſomewhat mitigated; and then from adminiſtering cathartic medicines by the mouth, ſo as to procure ſtools.

When there is a frequent inclination to vomit, an emetic may be given, which will ſometimes alſo procure a ſtool. By the operation of this, bile is often thrown up from the ſtomach; but the ſtools are not bilious; they are generally hard and very coſtive: purging clyſters ought therefore, after the emetic, to be adminiſtered every hour; and, at bed-time, opium given to the quantity of two or three grains.

When there is not any great inclination

* ℞ Aquæ tepidæ unc. vi. Tincturæ thebaicæ drach. unam—ad ſemunciam. M. fiat enema.

† ℞ Linimenti ſaponacei unc. iij. Tincturæ thebaicæ unc. ij. M.

to

to vomit, and the ſtomach will retain medicines tolerably well, which is generally the caſe in this diſeaſe, from two to four or five table-ſpoons of the oleum palmæ chriſti may be taken every hour, until a ſtool be procured; or doſes of ſal catharticum amarum, with manna and infuſion of ſenna, may be taken every hour, with the ſame intention. In either caſe the operation of the purgative will be greatly promoted by the warm bath.

Some have been ſaid to receive benefit from a mixture conſiſting of equal parts of olive-oil, lime-juice, and Holland gin; of which two ſpoonfuls were taken every half hour, until the pains were abated by a plentiful ſweat. Several other medicines for this diſeaſe may be ſeen in the Formulæ Medicamentorum, annexed to my Eſſay on preſerving Seamen.

To prevent a relapſe, which is very frequent, the patient muſt be kept in a lax ſtate for ſome time afterwards, by the daily repetition of the ſame purgative medicines, or by the gum pill with aloes*; and if diſ-

* ℞ P. ulæ gummoſæ gr. xv. camphoræ, aloes Soccotrinæ ana gr. iv. elixir aloes q. ſ. fiant pilulæ iv. quotidie ſumendæ.

treſſed

treſſed with rheumatic or paralytic complaints, nervous and ſtrengthening medicines ſhould be taken *.

When the vomiting is inceſſant, the pain very acute, and nothing can be retained upon the ſtomach, Sir John Eliot obſerves, " That ſtools may be procured, and all the uneaſy complaints removed, by giving purgatives, joined with opiates and camphire †. At the ſame time emollient clyſters ſhould be given, and the belly fomented with the fotus communis, to which ſoap ought to be added, when the conſtipation is remarkably obſtinate."

* ℞ Balſami Peruviani (in vitello ovi ſoluti) drach. ij. aq. font. unc. vi. tinct. valerianæ ſimpl. unc. i. ſpir. lavendulæ comp. ſemunc. ſyrupi balſamici drach. vi. M. Doſis unc. i. ſs. bis die.

Vel ℞ Salis ſuccini ℈ ſs, ſalis cornu cervi gr. vi. aquæ font. drach. x. aq. juniperi comp. drach. ij. ſyr. e corticib. aurunt. drach. ij. M. fiat hauſtus octava quaque hora ſumendus.

† ℞ Pilulæ ex colocynthide ſimp. ſcrupulum unum, calomelanos, camphoræ, ſingulorum grana quatuor, opii grana duo; fiant pilulæ numero ſex quarum duæ aſſumantur quaque hora, donec bis terve ſoluta fuerit alvus. Camphora cum guttulis aliquot ſpiritus vinoſi rectificati teratur, ut molleſcat, atque opium eodem modo emolliatur, his peractis, perfecte miſceantur cum reliquis.

The

The dry belly-ache, though one of the moſt painful and excruiating diſtempers, ſeldom proves mortal, unleſs it has been occaſioned by ſleeping on the ground expoſed to the night air, or by drinking immoderate quantities of newly diſtilled ſpirits, which are too frequently made uſe of in the beginning of the diſeaſe.

SECT. IV.

The Tetanus and Locked Jaw.

THE tetanus, emphroſthotonus, and opiſthotonus, are moſt frequent in hot countries; in all of them opium ſeems to be the principal remedy.

In theſe diſeaſes, opium may be adminiſtered in very large quantities. It ſhould be given at firſt in a full doſe, and be afterwards repeated every hour, with an increaſe of the quantity in proportion to the violence of the ſpaſms, until relief be obtained. In a caſe of the opiſthotonus at Haſlar hoſpital, the extractum thebaicum was given,

to the quantity of a ſcruple, in leſs than twenty-four hours. In another caſe, it was remarkable, that an application of opium and camphire to the feet, removed the ſpaſm, and upon taking off the application, the ſpaſm ſoon returned with its former violence: an effect which was ſeveral times produced by the repeated application and removal of theſe medicines.

The ſpaſm moſt fatal to Europeans in hot countries is the Locked Jaw, which is the frequent conſequence of an amputation, or even ſometimes of a ſlight wound, in thoſe climates. Towards the end of the former war, at one of the moſt remarkable ſieges in the Weſt Indies, that of the Havannah, five perſons in ſix, whoſe limbs were amputated, died of this ſpaſm.

There does not appear to be any fault in the blood in ſuch caſes, nor any general diſorder in the ſolids affecting the principles of life, this being merely a local muſcular ſpaſm. Hence it is to be hoped that by a ſufficient number of experiments an effectual method may be diſcovered of preventing or removing ſo dangerous a ſymptom; for this purpoſe I beg leave to offer two ſuggeſtions.

As

As the locked jaw moſt frequently makes its appearance in warm weather, and in hot countries, would not an immediate change of air prove the means of ſaving the patient's life? And where it is impoſſible to remove the patient into a cool air, would not ſome benefit be derived from the immerſion of the whole body, or part of it, in cold water; adding frequently ſal ammoniac or nitre, in ſuch quantities that by their continual ſolution the water may acquire the utmoſt degree of coldneſs? Agreeable to this my friend Dr. Wright has of late very ſucceſsfully employed at Jamaica the affuſion of cold water on the naked body in caſes of locked jaw.

As the internal uſe of opium has been frequently found ineffectual to remove this dreadful ſymptom, would it not be greatly aſſiſted by the external application of a ſtrong ſolution of opium to the wounded part, and even to the ſeat of the ſpaſm, in ſuch a quantity as to bring a numbneſs and paralyſis on thoſe parts?

The uſe of mercurial ointment in the tetanus and locked jaw has of late, I am informed, been attended with conſiderable ſucceſs.

ſucceſs. As ſoon as a ſalivation is produced, it is ſuppoſed the cure is accompliſhed; and, in order to procure this more ſpeedily, the patient is put into the warm bath: opium is given at the ſame time, to procure ſleep. A more particular account of this has lately been laid before the public by Dr. Donald Monro.

SECT. V.

The Barbiers.

THE barbiers is a ſpecies of palſy, moſt frequent in India. It diſtreſſes chiefly the lower claſs of Europeans; who, when intoxicated with liquors, frequently ſleep in the open air, expoſed to the land winds. Its attack is generally ſudden, and entirely deprives the limbs of their motion. Sometimes all the extremities of the body are affected, ſometimes only part of them.

The natives of the country have a method of putting the patient into a hole dug in the ground, and covering him with ſand up to his

his neck: this is done in the middle of the day, and he remains there as long as he can bear the heat of the ſand, which is conſiderable. Camphire and a decoction of Guaiac-wood have ſometimes produced a good effect; alſo the expreſſed bitter oil of the mergooſe, an Indian plant. But notwithſtanding the uſe of the moſt powerful nervous medicines, the patient generally continues paralytic for ſome months, unleſs he is removed into another air.

On the Malabar coaſt this diſeaſe is moſt violent and frequent, and attacks both natives and ſtrangers, eſpecially in the months of December, January, February, and March, During theſe months the land-winds blow every morning about ſun-riſe, from the neighbouring mountains, with remarkable coolneſs; and ſuch, as being tempted by the ſerenity of the ſeaſon, ſleep expoſed to theſe winds, are often ſuddenly ſeized with a very painful ſenſation in the perioſteum of the arms and legs. In perſons of a good conſtitution, this pain abates as the day advances, and as the air becomes warmer; but in others it continues for a conſiderable time, attended with a weakneſs of the knees,

and uneaſy ſenſation in the calves of the legs and ſoles of the feet, eſpecially on any attempt to walk. This is ſcarce ever cured by medicine till after the ſhifting of the monſoon, unleſs the patients can be removed to the coaſt of Coromandel, or to any place to the eaſtward of the Balagat mountains, where, by the change of air, they quickly recover.

CHAP. II.

Directions for Europeans on their return home, whose constitutions have been impaired abroad.

SECT. I.

Directions for those of a relaxed and bilious habit of body.

PEOPLE whose health has been impaired abroad in hot climates, and who propose to revisit England, should endeavour to arrive in the beginning of summer, as they will find the winters of Great Britain, on their first arrival, too piercing and severe for their constitution.

If they have lost their complexion, and have a yellow tinge in their eyes or countenance; if the stomach be much weakened, the digestion bad, and the constitution infeebled and relaxed; if they have had frequent fits of the cholic; or if an hardness remains in the liver, spleen, or any of the

 bowels,

bowels, they ought immediately to go to Bath. They will find the Bath waters an excellent reſtorative, and well adapted to theſe complaints. They will alſo find them proper for a contraction of the limbs remaining after the dry belly-ache.

Thoſe who are ſubject to bilious cholics and obſtructions, occaſioning a hardneſs of the abdomen, frequent coſtiveneſs, and a vomiting at intervals of pure bile, ſhould take a tea-ſpoonful of elixir aloes morning and evening, and 20 or 30 drops of elixir vitrioli twice or thrice a day, upon an empty ſtomach. When there is a pain, hardneſs, and ſwelling of the liver, the part ſhould be anointed with mercurial ointment, and mercurial pills * be taken, in ſuch ſmall doſes as not to affect the mouth or weaken the conſtitution by purging.

* ℞ Argenti vivi, pulveris rhabarbari, ſaponis albi Hiſpanici, ſingulorum partes æquales: tere argentum vivum cum mucilagine gummi Arabici, donec globuli mercuriales non amplius appareant; dein adde ſaponem atque rhabarbarum, et cum mucilagine gummi Arabici in maſſam pilularem redige; e ſingulis drachmis fiant pilulæ duodecem, quarum capiat æger duas vel tres mane & veſpere.

There

There are however three caſes of ſuch patients which forbid the uſe of the Bath waters, and which require very different means of relief: a conſumptive habit of body, a dropſical habit, and an habitual flux.

SECT. II.

Directions for thoſe of conſumptive and dropſical habits of body.

PERSONS of a conſumptive habit bear ill too ſudden a change from a hot to a cold climate. I would adviſe ſuch, before they land in England, to paſs a winter at Liſbon, Naples, or the ſouth of France.

It would exceed much the limits aſſigned to this Eſſay, to give a full account of the treatment of perſons in general of conſumptive and dropſical habits; I confine myſelf chiefly to that peculiarity in their ſituation which ariſes from their returning under ſuch circumſtances from a hot to a cold climate.

The proper medicines for this complaint I formerly gave under the article Phthiſis,

in the Formulæ Medicamentorum, annexed to my Eſſay on preſerving Seamen. I may farther obſerve, that ſometimes the hot-well waters of Briſtol, a voyage at ſea during the ſummer, and iſſues in the affected ſide, have been attended with benefit.

In habits exhauſted by a long reſidence in warm climates, attended with hardneſs of the abdomen, bilious purging ſtools, and hectic fever, Sir John Eliot informs me, "that he has often ſucceeded by laying aſide the uſe of opiates, aſtringents, and ſtrengtheners, and putting them upon a diet of milk and fruits; at the ſame time giving the ſal polychreſtum as an alterative; or if it produced too much irritation in the ſtomach and bowels, giving it with gum Arabic. During this courſe, and whilſt the hardneſs remained, the belly was rubbed, night and morning, with a ſtrong decoction of the cicuta made in oil. In all conſumptive caſes, where the fever was conſiderable, Sir John obſerves, riding as well as every other exerciſe did hurt, increaſed the violence of the ſymptoms, and rendered the diſeaſe more ſpeedily fatal. He has never ſeen any good effects from the uſe of the bark in ſcrophu-

lous

lous habits, where there were marks of inflammation, but generally it produced a confirmed phthiſis, by increaſing the fever, and bringing the tubercles to ſuppuration: and has been confirmed in this opinion, by the repeated obſervations alſo of the late Sir William Duncan."

Perſons who are of a dropſical habit of body, may come directly from a hot country to England. A cool air will contribute much to their recovery.

The beſt method of treating ſuch dropſical caſes has been given by Dr. Monro and Baron Van Swieten *. I have only to add, that when the conſtitution was tolerably ſound, I have often cured very obſtinate dropſies, by exciting a gentle ſalivation with a ſcruple of pilulæ mercuriales, taken every other night, and by giving, on the intermediate days, a mixture with ſquills and ſal diureticus †.

By this method I cured above forty dropſical patients in the year 1765, who were

* See Monro's Eſſay on the Dropſy, and Van Swieten Comment. in Boerhaavii Aphoriſmos, tom. iv.

† ℞ Aq. pulegii ſimpl. unc. v. aq. raphani comp. unc. i. ſalis diuretici drach. i. oxymel. ſcillitici unc. ſs. M. cap. unc. ſs. 4tis horis.

 ſeized

ſeized with the diſeaſe after obſtinate intermitting fevers; and have ſince found it frequently effectual in removing the dropſies which were the produce of hot climates.

SECT. III.

Directions for thoſe who labour under an habitual Flux

THE moſt frequent diſeaſe to which perſons are ſubject, who have ſuffered much ſickneſs abroad, is an habitual flux.

Rhubarb or ipecacuanha in ſmall doſes, frequently give relief in this complaint: when theſe have failed, and even though joined with opiates, ſeemed to ruffle the patient, I have obſerved good effects from ten grains of lapis calaminaris finely levigated, mixed with an equal quantity of philonium Londinenſe, given morning and evening. A decoction of the Simaruba bark *, when it does

* ℞ Corticis ſimarubæ unciam unam, aquæ fontanæ ſeſquilibram; coque ad libram unam: tum colandus eſt liquor,

does not offend the ſtomach, is alſo frequently of ſervice.

Among an uncommon number of ſuch patients, whom I have had opportunities of viſiting, I always found, that if the flux was very obſtinate, no relief could be obtained without the aid of opium. There was a neceſſity for adding it to all the other medicines, whether purgative or aſtringent. Opiates, eſpecially thoſe of the warmer kind*, are as effectual in ſuch caſes, as the bark is in agues. If the patient ſeems more relaxed during the uſe of them, or more purged after the ſhort reſpite obtained from them, theſe are proofs, not of any injury done by the medicine, but of the ſtrength of the diſeaſe overpowering the efficacy of the remedy.

liquor, quem totem partitis hauſtibus ægrotus ebibeat quotidie ante meridiem.

This medicine I firſt uſed on the recommendation of Dr. Wind.

* ℞ Philonii Londin. drach. ſs. pulv. rhabarbari gr. x. ſyrupi papaveris albi q. ſ. fiat bolus mane et hora decubitus ſumendus.

℞ Olei cinnamomi guttam unam, opii puri granum unum, confectionis cardiacæ, boli gallicæ ſing. ſcrupulum unum, ſyrupi cujuſlibet, q. s. fiant pilulæ.

This

This diſeaſe, by its continuance, ſinks the patient's ſtrength, but frequently ſtops before death. I have ſeen an hundred caſes where, after the whole fluids of the body had been, as it were, drained by a long continued flux, the diſcharge at length ſtopt, and the patient lived in good ſpirits for ſome weeks, though reduced to a perfect ſkeleton. After death, the inteſtines were found perfectly free from ulcerations, and in a ſound ſtate.

END OF PART III.

APPEN-

APPENDIX.

On the Intermitting Fever.

Its ſimilarity in England to the endemic of hot climates. Its prevention. Its cure. Treatment in the cold fit, hot fit, intermiſſion. Of the bark; requiſite preparation of the body, period of the diſeaſe, manner of exhibiting it. Treatment of children. Treatment of ſymptoms. Remedies when the bark cannot be uſed. External applications. Remedies uſed by the vulgar. Treatment under imperfect intermiſſions. Recommendation of opium in the hot fit.

HAVING treated of the Diſeaſes peculiar to different countries abroad, I cannot diſmiſs the ſubject, without offering a few thoughts on Agues, the endemial diſeaſe of marſhy ſituations in England.

The

The directions already given for the prevention of ſickneſs in foreign climates, it will thence appear, are the moſt proper for preventing the prevailing diſeaſe of low ſituations in our own climate; and the methods propoſed for the cure of this our own endemic, will be found the moſt ſucceſsful that can be uſed for the cure of the endemic diſeaſes of other countries.

An intermitting fever, or what is uſually termed an ague, is a diſeaſe peculiarly frequent in low, woody, and marſhy places; there perſons of all ages, and of both ſexes, are ſubject to its frequent attacks; even infants at the breaſt are not exempted from it. It is worſt at particular ſeaſons of the year, and in ſome years prevails more than in others. It is far from being mortal to the natives, but its long continuance is apt to impair their conſtitutions, and to produce obſtinate chronical diſtempers. To ſtrangers and to perſons accuſtomed to a pure air, it proves particularly ſevere, and ſometimes fatal.

The means neceſſary to be employed in aguiſh ſituations and ſeaſons, to guard againſt the attack of this diſorder, firſt claims our attention.

Its

Its prevention is a ſubject of greater difficulty than its cure. We are acquainted with remedies which ſeldom fail of removing the diſeaſe, but have not yet been able to diſcover means equally certain of preventing its return, or of guarding againſt its attacks in an impure air.

The immediate cauſe of agues, in unhealthy ſituations, is the ſoil and air of the place: but the more remote cauſes, or thoſe which render the conſtitution ſubject to the attack, are various. Under this head may be included, however, all thoſe which produce a chillneſs of the body, and are generally ſaid to be productive of colds, as lying in a damp room or in linen not ſufficiently dry, travelling expoſed to a cold damp night, neglecting immediately to put on dry cloaths after being wet by rain, and the like. The vulgar aſcribe moſt fevers, agues, and other diſorders, both in hot and cold climates, to ſuch cauſes, or to irregularities in living: but they only diſpoſe the conſtitution to receive the hurtful impreſſions of a bad air.

The firſt direction that we ſhall give for the prevention of agues is, that perſons ſubject

ject to that diseafe fhould not refide in low marfhy places during aguifh feafons, but fhould then retire into large towns, where the bad effects of a damp air are in fome meafure corrected by the number of fires and the fmoke. It has always been remarked, that agues are not only more frequent, but alfo more violent, in the country and farm-houfes, than in large villages or towns; and a retreat thither, or to a more dry and elevated fituation, although at no great diftance, often proves the moft effectual prefervative againft them. In the autumn of the year 1759, two regiments, which lay encamped on South-Sea Common near Portfmouth, were greatly diftreffed with intermitting fevers and fluxes; but upon leaving that fpot of ground, and encamping about five miles diftant from it, on Portfdown-hill, not one man was afterwards taken ill of thofe difeafes.

Secondly, when neceffity obliges people to remain in unhealthy fituations, in order to avoid the influence of the damp air, they fhould fleep, during the aguifh feafon, in the higheft apartments of their houfe, and in thofe which look to the rifing and meri-

dian ſun: they ſhould ſhut up thoſe doors and windows which front the low grounds or marſh; they ſhould wear warm cloathing, and ſhould indulge in a plentiful diet of fleſh, with wine and ſpices. Smoaking of tobacco would alſo prove beneficial.

Thirdly, perſons in aguiſh places and ſeaſons ſhould carefully avoid all ſudden tranſitions from extreme cold to great heat, or from great heat to an exceſs of cold; and they ſhould particularly avoid expoſing the body to an eaſterly wind, rain, or night fogs. They ſhould never go abroad in the morning with an empty ſtomach; when faſting, they are moſt ſuſceptible of the impreſſions of a damp, raw air; but, previous to labour or amuſement in the fields, they ſhould take either a glaſs of wine, with a ſlice of bread, or drink a ſmall quantity of chamomile or bark tea. Labourers who are obliged to work in the open air, before the ſun has diſperſed the unwholeſome vapours ariſing from low meadows or marſhes, ſhould be allowed by their maſters an infuſion of ſome garlic, bark, and rhubarb, in brandy, of which they ſhould receive a dram, either by itſelf, or diluted with water, in the morning,

before

before they go abroad, eſpecially when employed in digging ditches, draining marſhes, and the like dangerous occupations. They ſhould alſo on ſuch occaſions chew garlic or rhubarb, put ſmall plugs of tobacco in their noſtrils, and not ſwallow their ſpittle.

Fourthly, ſtrangers in aguiſh places, and perſons ſubject to agues, ſhould take, every other night, two or three tea-ſpoonfuls of tinctura ſacra, or a few grains of pilula Rufi, ſo as to prove gently purgative. For farther prevention, they may take every morning, before breakfaſt, a wine glaſs of an infuſion of the bark and orange-peel in water*; or, what will prove more effectual, a table-ſpoonful of a ſtrong tincture of the bark in ſpirits †, diluted occaſionally with water. Such as would prefer external, though leſs efficacious means of ſafety, may wear garlic or camphire, ſewed up in a piece of linen, and ſuſpended at the pit of the ſto-

* Recipe Corticis Peruviani contuſi unc. i. Corticis aurantiorum Hiſpalienſium ſemunciam, aquæ fontanæ bullientis ſeſquilibram: ſimul infundantur: ſubſidentia depuretur liquor, et tempore uſus caute effundatur.

† Recipe Cort. Peruviani triti unc. i. ſpiritus vinoſi Gallici unc. viij. Digere per quatriduum et cola.

mach

mach or the groin: the known efficacy of remedies outwardly applied, and the extreme ſubtilty of the effluvia from thoſe here mentioned, render ſuch preſervatives not altogether ſo contemptible as commonly imagined. The cold bath ſhould be uſed as often as the weather will permit, which, by invigorating the body, enables it more ſtrongly to reſiſt the impreſſion of a bad air.

In the cure of this diſeaſe, early recourſe ſhould be had to medical advice. The diſeaſe, on its firſt attack, is with difficulty diſtinguiſhed from other fevers, and it gains additional ſtrength from its duration.

On the approach of the cold fit, as ſoon as a perſon is ſeized with a fit of ſhivering, or the chills of an ague, he ſhould go to bed; and mixing two ounces of vinegar with a quarter of an ounce of finely powdered chalk, or of prepared crabs eyes, ſhould drink them immediately while in an effervescent or fermenting ſtate. If this draught be nauſeated by the patient, or if the cold fit ſhould continue for ſome time after its uſe, a tea-ſpoonful of ſpirit of hartſhorn ſhould be taken in a draught of warm wine

whey, or of balm tea, every half hour, until the patient falls into a ſweat: The patient, in the mean time, ſhould be kept warm in bed: If the ſweat does not appear ſoon, bottles of warm water, or bricks heated at the fire, ſhould be applied to his feet. Theſe generally ſhorten the cold fit, and produce a profuſe ſweat. The repetition of them alſo in the ſubſequent paroxyſms prove equally ſerviceable, as I have experienced in ſeveral hundred caſes. I have ſometimes known agues entirely removed by them after the moſt powerful remedies given in the other ſtages of the diſeaſe had failed. In the firſt fit, the uncertainty of the future diſeaſe renders it neceſſary to proceed with caution; afterwards, when the true nature of the diſeaſe is diſcovered, the practice may become more bold.

During the hot fit, when mild, ſcarce any medicine is requiſite upon the firſt attack of an ague; but when protracted to an unuſual length, or accompanied with alarming ſymptoms, a bliſter ſhould be applied to the back, and tartar emetic given in ſmall doſes, with an opiate after its operation *. In the future paroxyſms, the hot

* See part III. chap. I. on continual Fevers.

fit may be ſhortened by the exhibition of an opiate, in a full doſe, half an hour after its commencement, without any antimonial medicine; which method quickly abates the fever and produces a ſweat, as will more fully appear in the ſequel. It is from the protracted ſtate of the hot fit that the greateſt danger is to be apprehended: in low fenny countries, agues frequently make their attack, during the autumn, under the form of a continual or remitting fever, attended with violent ſymptoms, eſpecially a delirium, from whence that ſtate is commonly denominated the phrenzy fever. This fever, unleſs brought to a ſpeedy remiſſion, is attended with conſiderable danger; and the moſt effectual remedies for procuring this are bliſters and antimonials. If large quantities of blood be repeatedly taken, by miſtaking the diſeaſe for a true inflammatory fever, its obſtinacy and fatality are greatly increaſed. Profuſe bleedings are more particularly hurtful when ſymptoms indicate a ſpeedy remiſſion of the fever, or its termination in a regular ague, which commonly is prevalent at the ſame time.

During the intermiſſion of the fever,

whether obtained from the medicines prescribed or from the natural courſe of the diſeaſe, the bark ſhould be given. In the proper adminiſtration of the bark, the cure of agues may be ſaid entirely to conſiſt; other remedies ſeldom become neceſſary unleſs to prepare the body for this, to alleviate particular ſymptoms, or to relieve in caſes where the bark cannot be uſed.

The preparation of the body requiſite previous to the adminiſtration of the bark, is not conſiderable. It is ſufficient to cleanſe the ſtomach and alimentary canal by an emetic or purge. When there is any ſickneſs, I generally give ſix grains of ipecacoanha as an emetic; when there is no ſickneſs, I prefer a ſtomachic purge, as an ounce or two of tinctura ſacra, or a few grains of the pilula Rufi. Theſe I give in the intermiſſion, as ſoon as the patient is free from fever, ſo that their operation may be over before the return of the fit. As ſoon as the operation of the emetic or purgative is over, the bark may be given with perfect ſafety. The bark may be adminiſtered at any period of the diſeaſe. When the ague is ſlight, it need not be given till a ſecond fit has evinced the

true

true nature of the diſeaſe; but when the ague is ſevere, there is frequently an abſolute neceſſity of adminiſtering it upon the firſt intermiſſion, even with ſcarce any preparation of the body: inſtances have occurred on unhealthy ſpots in England, of agues having been ſo malignant, after hot ſummers, that a return of the fit ſometimes proved fatal.

It is with many an opinion, that an ague muſt continue ſome time before it is completely formed, and that till ſuch time it is highly dangerous to apply any remedy. This however daily experience contradicts: an ague cannot be ſtopt too ſoon; the more ſevere it is, the more urgent is the neceſſity of applying the remedy; as the conſtitution is always found to ſuffer leaſt, where the ague is early removed. Some confine this prejudice only to the exhibition of the bark, and refer to that medicine all the bad ſymptoms which are the natural conſequences of the continuance or malignity of the diſeaſe. But moſt of the prejudices entertained againſt that medicine, are founded on imperfect obſervation, and proceed from not diſtinguiſhing the effects of the remedy from thoſe of the diſeaſe.

The advantage of adminiſtering the bark, as early as poſſible in the diſeaſe, fully appeared in the year 1765 and the two following years, during an uncommon prevalence of remitting and intermitting fevers, which ſpread themſelves over the greateſt part of England, and furniſhed me with a number of patients, labouring under all the ſymptoms of theſe diſeaſes.

When the ague was ſtopped by the bark, after the firſt or ſecond fit, as in my own caſe, and thoſe of two hundred of my patients, neither a jaundice nor a dropſy enſued. When the bark could not be adminiſtered, on account of the imperfect remiſſions of the fever, or when the patient had neglected to take it, either a dropſy or jaundice was the certain conſequence; and the degree of violence with which it attacked was in proportion to the number of the preceding fits, or to the continuance of the hot fit. By every paroxyſm the dropſical ſwellings were viſibly increaſed, and the colour of the ſkin rendered of a deeper yellow.

When the fever continued a few days without remiſſion, the belly and legs generally ſwelled; a violent head-ach and vertigo

tigo alſo generally diſtreſſed the patient; ſo that ſome even after the fever had left them, were not able to walk acroſs their chamber for a fortnight or three weeks.

When the returns of the fever were perfectly regular, and even ſlight, four or five fits of a ſimple tertian were ſometimes followed by the moſt dangerous ſymptoms; eſpecially in the year 1765, when theſe fevers raged with the greateſt violence: as in the following inſtance. A boy of 14 years of age was attacked with an intermitting fever. I ordered him a doſe of tinctura ſacra, and afterwards the bark; but to my great ſurprize, notwithſtanding ſeveral ounces of bark had been preſcribed, his ague continued. After having ſuffered ſix fits of it, I found a conſiderable quantity of water in his breaſt, belly, and legs; and his countenance was ſo bloated and yellow, that the caſe ſeemed deſperate. I was then informed, that having an inſuperable averſion to medicines, he had not taken any of the bark, but was now willing to ſubmit to every thing that would contribute to his recovery; and immediately ordered him to take a drachm of the bark every two hours, and occaſionally a mixture of ſyrupus ſcilliticus with ſal

 diureticus.

diureticus. By these means another fit, which, in all probability, would have put an end to his life, was effectually prevented.

When a dropsical patient suffered a relapse into the ague, which frequently happened, there was an absolute necessity for putting an immediate stop to it by the bark; and in above seventy such patients, I never observed any other than the most beneficial effects to have resulted from it.

I never prescribed the bark until the patient was free from the fever; and then, without regard to a cough or any other chronical indisposition, I ordered it to be given in large doses. I have given the bark in every circumstance attending intermitting fevers during their remission, but never gave it during the fit.

Having shewn the necessary preparation of the body previous to giving the bark, and having recommended the use of that remedy early in the disease, we proceed to the manner of administering it. The bark frequently fails in removing intermitting fevers, from not persevering, for a sufficient length of time, in its use; from administering it in too small a dose; or from giving it in an improper form. As

As to the firſt, is is a prevailing opinion, that an ounce, or an ounce and an half of the bark taken during one intermiſſion, ſhould entirely prevent the return of another paroxyſm. But this is a miſtake; ſometimes it may be ſufficient; at other times another and ſevere fit will attack a patient who has taken that quantity: in this caſe, inſtead of doubting the efficacy of the medicine, the patient ought to perſevere during the following intermiſſions, with an increaſe of the doſe, until five or ſix ounces at leaſt have been taken. The medicine ſhould alſo not be omitted as ſoon as one fit is ſtopt, but ſhould be continued in a ſmaller doſe for at leaſt ten days or a fortnight. And it would be adviſeable, even for ſeveral months after the diſeaſe is removed, to take a little bark occaſionally in damp weather or during an eaſterly wind, to prevent a relapſe.

The bark is often given in too ſmall doſes. Where the intervals between the fits are ſhort, as in quotidians and double tertians, from one drachm to two drachms of it ſhould be taken every two hours. Where the interval between the fits is longer, the doſes may be ſmaller and more diſtant.

The

The form in which this medicine is administered is of some consequence. Mucilages and syrups have been recommended to conceal the taste of it; but I find nothing more effectual for this than small beer or milk, especially the latter. A drachm of bark in two ounces of milk, drank quickly after it is mixed, may be easily taken by a person of the most delicate taste; and by washing the mouth afterwards with milk, there will not remain the least flavour of the bark: If the mixture be not drank immediately, the bark will impart to the milk a bitter taste. The bark is commonly given in electuaries or boluses; but in these forms it proves much less efficacious than when given in juleps or draughts, with the plentiful addition of wine or spirits. I have observed that six drachms of powdered bark, given in a julep, consisting of one-fourth or one-third of brandy, is as effectual as an ounce given in the form of an electuary, and proves less disagreeable to the stomach. For patients unaccustomed to wine or spirits, each draught should be warmed with the spiritus salis ammoniaci, or with the tinctura myrrhæ;

myrrhæ*; both which improve the efficacy of the bark. Many have imagined that the virtues of the bark are aſſiſted by the radix ſerpentariæ and ſal abſinthii; ſome by the elixir vitrioli, or tinctura roſarum; and others by camphire, cinnabar, warm ſtomachics, and ſteel. But being thoroughly convinced that the virtues of the bark are greatly improved by wine or ſpirits, I now ſeldom preſcribe with it any of the abovementioned ingredients, which might render it more nauſeous and diſagreeable.

When the bark is entirely nauſeated, from a weakneſs of the ſtomach, or from an averſion of the patient to the taſte of the medicine, it will be proper to leave off the uſe of draughts, and to give the bark in clyſters. In this form I have found it as effectual as when given by the mouth. A cathartic clyſter ſhould firſt be adminiſtered, after the operation of which the bark clyſters ſhould be given, and repeated every

* A drachm of the bark in powder may be given in two ounces of an aqueous vehicle. That quantity would require half a ſcruple by weight of the ſpiritus ſalis ammoniaci, or a drachm of the tinctura myrrhæ.

three

three or four hours. They are beſt compoſed of a ſolution of the extract of bark, with the addition of a ſufficient quantity of the tinctura thebaica, in order to its being longer retained*; a ſmall quantity of opium being commonly found effectual to prevent the bark, in any form, from purging. An obſtinate intermitting fever, which two ounces of the bark in draughts, taken in each interval of a fit, had failed to remove, was effectually cured by two ounces of the extract given in clyſters. The extract has been adminiſtered in clyſters to the quantity of ſix ounces, to patients who could not have received half an ounce of the bark in any other form; and many have been cured by clyſters, after large quantities of the bark had been unſucceſsfully taken by the mouth; it being in this manner that the largeſt quantities of bark can be adminiſtered.

It is frequently almoſt impoſſible to make children ſwallow any medicine which has a

* Rec. Extracti corticis Peruviani ſemunciam; ſolve coquendo in aquæ fontanæ unc. iv, et adde olei olivarum ſemunciam, tincturæ thebaicæ gutt. v ad x: fiat enema quarta quaque hora injiciendum.

disagreeable

disagreeable taste or smell. Therefore, for children labouring under intermitting fevers, I order the spine of the back to be anointed, at the approach of the cold fit, with a liniment composed of equal parts of tinctura thebaica and linimentum saponaceum, which I have found has often prevented the fit. If this should not produce the desired effect, two or three tea-spoonfuls of syrupus e meconio, given in the hot fit, will generally be found to mitigate the symptoms. But for the entire removal of the disease, after purging with magnesia alba, I prescribe the bark in clysters; giving a drachm of the extract of bark, with a few drops of the tinctura thebaica, in each clyster, to be repeated every three hours, for a child of a year old. The magnesia often occasions a vomiting, when the stomach is oppressed with phlegm; which evacuation should be promoted with warm water. The constant heaviness of the head, occasioned by these fevers, in such tender constitutions, is best relieved by the application of a blister to the back. The bark may also be applied externally to children: mixed with theriac and camphire, it may be applied in a poul-

tice

tice to the ſtomach or wriſts; or ſewn between the folds of a linen jacket, it may be worn next to the ſkin: and infants may ſometimes be dipt in a decoction of it.

Of between four and five hundred patients, afflicted with remitting or intermitting fevers, under my care in the year 1765, I loſt only two; neither of whom had taken the bark.

My method of treating thoſe patients will appear in the following caſes:

1. A young gentleman was ſeized with a fit of an ague, and in half an hour became delirious, then comatoſe, at length ſpeechleſs. Finding him in this ſtate, I ordered a bliſter to be immediately applied to his back, and a cordial julep with ſalt of hartſhorn to be poured by degrees into his mouth. In two hours afterwards, upon recovering his ſenſes ſo as to ſwallow with eaſe, I ordered him two ounces of tinctura ſacra, and then, as ſoon as the fever and ſweat had abated, without waiting for the complete effect of the purge, half a drachm of the bark every four hours. He began the uſe of the bark three hours after he had taken the tinctura ſacra; but before he had taken five drachms of it, he

he was ſeized with a ſecond fit, and, in like manner became delirious, comatoſe, and ſpeechleſs. Sinapiſms were applied to his feet, and other irritating applications uſed, until the fever was terminated by a plentiful ſweat. Thus having twice narrowly eſcaped dying in the fit, a drachm of the bark was ordered to be taken punctually every hour. He ſoon took two ounces of it; which had ſo happy an effect, that the fever left him entlrely, and he had not any ſubſequent dropſy, jaundice, head-ache, or great weakneſs, which either the continuance of the fever, or its repeated attacks, often brought upon others; ſo that he was quickly reſtored to perfect health.

2. A lady, on the firſt attack of an intermitting fever, was ſeized with a violent pain in the ſtomach. Every ſubſequent fit increaſed that pain, inſomuch that at length it became intolerable, was attended with a violent delirium, and brought on a great difficulty of breathing, a hiccup, a ghaſtly countenance, and the ſymptoms of approaching death. She found no benefit from emollient fomentations, from the external application of tinctura thebaica, or even

even from a bliſter. I ordered two ounces of the bark to be taken during one intermiſſion of the fever. This effectually prevented its return, and did not in the leaſt increaſe the pain in the ſtomach; on the contrary it greatly contributed to the relief of the pain by removing the fever, every fit of which had ſo exaſperated its violence.

Particular ſymptoms ſometimes required a deviation from this general treatment. When the patient complained of a ſickneſs at the ſtomach, reachings to vomit, or a ſpontaneous vomiting, a vomit was adminiſtered; and the bark was not given till this ſickneſs was removed, or a purgative had cleared perfectly the whole alimentary canal.

Patients who laboured under a cough and a pain in the ſide affecting the breathing, were treated with warm fomentations, the balſamum anodynum Batæi, or a bliſter. When they were not relieved by theſe, I generally ordered a few ounces of blood to be taken away. But I principally endeavoured to ſtop the fever as ſoon as poſſible, by the adminiſtration of the bark; having found that every return of the fever increaſed ſuch pains.

When

When the head-ache was very violent, and continued during the intervals of the fit, the ſucceſs of the bark was rendered more complete by the application of a bliſter to the back.

A giddineſs of the head, which is the ſymptom moſt commonly remaining after even a ſlight intermitting fever, was generally relieved by the* ſal cornu cervi, and the bark in wine.

When, from the long continuance of the fever, the patient was diſtreſſed with flatulence, a diſtenſion of the abdomen, and a ſwelling of the legs, a ſpoonful of tinctura ſacra, with the addition of thirty drops of the ſpiritus lavendulæ compoſitus, was ordered to be taken every night.

To prevent relapſes of the ague, a continuance of the bark, a change of air, and the cold bath, were often found requiſite.

Although in the year 1765, and the two following years, I annually preſcribed upwards of an hundred and forty pounds weight

* ℞ Aquæ alexiteriæ ſimplicis ℥ vii, ſalis cornu cervi ʒ ſs, ſyrupi e corticibus aurantiorum ℥ i, m. fiat julepum, capiat cochlearia duo ſubinde.

of bark, I never obſerved any bad ſymptoms which could with propriety be aſcribed to its uſe, except in two inſtances. One in the caſe of a young woman, whoſe menſes were ſuppoſed to have been obſtructed by it for three months: the other, in that of a perſon ſubject to an habitual aſthma, who, after taking a drachm of this medicine, was ſeized with a ſuffocating fit of the aſthma, which continued until he vomited up the bark, when he received immediate eaſe. I have obſerved that patients are equally ſubject to relapſes, whether cured by the bark, or by other medicines; indeed I ſeldom preſcribed other medicines, until the bark had been firſt taken. In the winter of the year 1765, the quartan agues attacked thoſe only whoſe conſtitutions had been weakened by the long duration of their former agues.

It is ſometimes neceſſary to have recourſe to other remedies beſides the bark for the cure of intermitting fevers. Many patients have an inſuperable averſion to that medicine; by a long continued uſe it is apt to produce a nauſea, and ſometimes to loſe much of its efficacy; and there are inſtances of obſtinate intermitting fevers, which

which it has failed to remove. In ſuch caſes I have preſcribed various other medicines; but find that although an intermitting fever may be cured without the bark, there is not any other remedy which proves ſo generally ſucceſsful as it.

Next to the bark, I have preſcribed no medicine with greater ſucceſs than alum joined with nutmeg.

A bliſter to the back, and a decoction of bitters, with ſal abſinthii and ſal ammoniacum, have ſometimes ſucceeded with me in inveterate agues.

From ten to twenty grains of extractum gentianæ taken twice a day, with two ounces of tinctura ſacra three hours before the fit, have alſo removed very obſtinate intermitting fevers.

Five grains of the extractum cicutæ, taken morning and evening, ſometimes relieved.

What has proved more effectual is ſmall beer, in which glaſs made red hot has been quenched, uſed for common drink during the courſe of the bark, in ſuch a quantity as neither to prove violently emetic or purgative; It is ſometimes apt to purge, but

when its operation this way is too violent, the purging is ſoon checked by an opiate.

Among many other remedies, I have given the cortex caſcarillæ, to the quantity of half a drachm every four hours, but found its effects inconſiderable.

I have alſo tried a grain of the vitriolum cæruleum, taken twice a day; a medicine uſed in ſome hoſpitals: but as it occaſioned a conſtant ſickneſs and vomiting, even when joined with an opiate, few patients could be prevailed upon to perſiſt in the uſe of it.

The Faba Sancti Ignatii, recommended in the Madrid Pharmacopœia as a remedy for intermitting fevers under the title of Faba Febrifuga, and of which an account is given in the Philoſophical Tranſactions *, I gave to ſeveral patients. Two grains of it, infuſed in two ounces of boiling water, made a nauſeous bitter; repeated twice a day it cured four patients of quartan agues, but failed in double that number.

Various other medicines were preſcribed,

* Vid. The Philoſophical Tranſactions, N° 249, 250, and 257.

and often with ſucceſs. The forms of theſe are given in the ſubjoined note *.

Dr.

* Rec. Aluminis rupei gr. xv. nucis moſchatæ, extracti corticis Peruviani, ſingulorum gr. x. ſyrupi e corticibus aurantiorum q. ſ. miſce, fiat bolus bis die ſumendus.

Rec. Florum martialium, ſalis ammoniaci, ſingulorum gr. viij. myrrhæ gr. iv. rubiginis ferri gr. iij. extracti gentianæ gr. vi. ſyrupi e cort. aurant. q. ſ. miſceantur, fiat bolus bis die ſumendus.

Rec. Pulveris corticum aurantiorum ſemidrachmam ter die.

Rec. Pulveris florum chamœmeli ſemidrachmam, bis die.

Rec. Salis abſinthii drach. i. elixir aloes ſcrup. ii. vini albi unc. iij. miſceantur, fiat hauſtus.

Rec. Florum chamœmeli unc. ii. ſeminum ſantonici drach. vi. ſyrupi ſimplicis q. ſ. miſce, fiat electarium; capiat molem nucis moſchatæ quoque bihorio.

Rec. Salis abſinthii ſemidrach. ſpiritus vitrioli tenuis gutt. xxx. aquæ alexiteriæ ſimpl. unc. iv. miſce, fiat hauſtus, ingruente paroxyſmo ſumendus.

Rec. Florum chamœmeli, radicis ſerpentariæ Virginianæ, ſingulorum ſemunciam, limaturæ ferri drach. ij. ſyrupi e cort. aurant. q. ſ. fiat electarium, cujus capiat æger molem nucis moſchatæ quater in die.

Rec. Salis ammoniaci crudi drach. ij. ſalis polychreſti, ſpiritus volatilis aromatici, ſingulorum drach. i. aquæ menthæ vulgaris ſimplicis unc. viij. ſacchari albi unc. i. miſce, capiat cochleare unum ſingulis horis tempore paroxyſmi.

Dr. Morton's powder for agues* has been much celebrated. Dr. Boerhaave has recommended 20 grains of ſal ammoniacum to be taken two hours before the fit. This ſalt is perhaps beſt given in powder, wrapped up in wafer paper, that it may reach the ſtomach almoſt undiſſolved; and may be taken from a ſcruple to a drachm. Some add theriaca to the ſalt; which laſt medicine has been often taken by itſelf, upon the authority of Galen; and of late, both the ſal ammoniacum and theriaca are often joined with the bark. Dr. Hoffman recommends mercurius dulcis, and even a ſalivation, for the cure of obſtinate quartans. Dr. Huxham makes mention of mercurius alkalizatus, for the cure of intermitting fevers.

Rec. Salis ammoniaci crudi, theriacæ Venetæ, ſingulorum ſcrup. ij. miſce, capiat hora una ante adventum paroxyſmi.

Rec. Salis abſinthii drach. ij. vini albi lib. i. miſceantur, capiat partitis vicibus tempore apyrexiæ.

See other remedies in the Formula Medicamentorum, in my Eſſay on preſerving Seamen.

* ℞ Pulveris florum chamœmeli ſcrup. i. antimonii diaphoretici, ſalis abſinthii, ſingulorum ſemiſcrupulum. Miſceantur; fiat pulvis. quarta quaque hora, durante apyrexia, ſumendus.

fevers. Dr. Mead recommends, in caſe of a failure of the bark, a powder compoſed of chamomile flowers, myrrh, and ſalt of wormwood, with the addition of a little alum. A decoction of the flores chamœmeli has been much uſed, by way of a vomit, in this diſeaſe; and two ounces of this decoction, or of the infuſum amarum, with half a ſcruple of ſal abſinthii, taken every four hours, have been frequently preſcribed.

In the Eaſt Indies the Tellicherry bark, or what is there called the Cort. de Pala, has been found very beneficial in removing obſtinate intermitting fevers. The bark alſo of the mahogoni tree, which reſembles much the Peruvian bark and is often fraudulently mixed with it, is ſaid lately to have been found ſerviceable in Jamaica, for the cure of intermitting fevers.

Before the diſcovery of the bark, the cure of agues was generally attempted by bitters, ſuch as chamœmelum, centaurium minus, gentiana, cortex aurantiorum, zedoaria. Theſe bitters, together with fixed alkaline ſalts, are ſtill in great eſteem with ſome phyſicians, who entertain prejudices againſt

the bark; all which, it is to be hoped, will ſoon be removed.

Opinionum commenta delet dies.

External applications have conſiderable efficacy in this diſeaſe. Compoſitions of frankincenſe, cinnabar, camphire, wood-ſoot, turpentine, and the like applied to the wriſts, or ſometimes to the pit of the ſtomach, have been recommended by ſeveral very eminent authors; particularly Fuller's frankincenſe plaiſter *. I knew a gentleman labouring under a very obſtinate intermitting fever, who by applying to the wriſts whites of eggs beat up with ſalt, at the approach of the fit, often prevented it; eſpecially when a veſication enſued. Bruiſed garlic will often produce the ſame effect, but is apt to occaſion fainting fits, in delicate conſtitutions, being too acrid and irritating. I have found that anointing the ſpine of the back with the oleum ſuccini will prevent the fit of an ague as often as moſt external applications.

A change of air is frequently the moſt effectual

* ℞ Thuris drachm. ij. Tacamahacæ drachm. i. Croci ſemiſcrupulum, Terebinthinæ Venetæ q. ſ. Miſceantur, ut fiat emplaſtrum carpis applicandum.

fectual means of obtaining a cure: the moſt obſtinate intermittent I ever had occaſion to ſee was removed by a change from the land to the ſea air; the patient never had one fit after being ſent on board a ſhip.

There is perhaps no other diſeaſe for which ſo many remedies are daily recommended, as for an intermitting fever. Thoſe uſed by the vulgar are many; the principal of them we ſhall here enumerate.

In the cold fit, or juſt before its approach, are taken—Brandy from a glaſs to half a pint, by itſelf; or with a grated nutmeg, with half an ounce of brimſtone, or with half an ounce of powdered oyſter-ſhells.—A quarter of a pint of gin with a tea-ſpoonful of pepper.—A glaſs of uſquebaugh with a ſpoonful of lemon-juice.—A pint of wine taken by itſelf; or a glaſs of it with the white of an egg, with a ſpoonful of the juice of houſe-leek, or with the ſame quantity of the juice of plantain.—A ſpoonful of the ſpirit of turpentine.—Four ſpoonfuls of the juice of rue.—Half a pint of the juice of nettles.—Half a pint of the juice of groundſel.—Half a pint of a ſtrong decoction of

of cinquefoil.—Half a pint of a ſtrong decoction of ſpear-mint in milk.—A pint of a ſtrong infuſion of horſe-raddiſh in ſtale beer.—A pint of ſtrong beer, in which ſome broken pieces of glaſs bottles, or of flint-ſtones heated in the fire, have been quenched, and boiled.—A whole lemon.—A vomit of ſea-water.—The ſnuff of a candle with nutmeg.—A drachm of bark and theriac, with the juice of a large lemon.

In the intervals of the fit are taken,—Bay leaves dried and powdered, to the quantity of a drachm, three times a day.—The inner bark of the aſh, from half a drachm to a drachm, with a ſcruple of ſalt of wormwood, four times a day.—Half a drachm of the miſletoe of the oak, three times a day.—The inner bark of the elm near the root, to the quantity of a drachm, three times a day.—Half a drachm of the root of black thorn, taken three times a day.—A drachm of Calamus Aromaticus taken nine mornings ſucceſſively.—Half an ounce of brimſtone in a glaſs of ſtrong beer, taken three mornings ſucceſſively.—Half an ounce of muſtard-ſeed in half a pint of gin, three mornings ſucceſſively.—A common ſpider gently

gently bruiſed, and wrapped up in a raiſin, taken either in the cold fit, or three ſucceſſive mornings during the intermiſſions.—Five grains of cobwebs mixed with crumbs of bread, twice a day.

Among the external applications uſed by the vulgar for this diſeaſe, are—A hard-boiled egg ſplit, and applied hot to the wriſts.—Camphire and ſaffron, hung in a bag at the pit of the ſtomach.—Rubbing the back-bone with garlic.—Bruiſed ſpiders and tobacco applied to the wriſts.—Petroleum, applied either to the feet or wriſts.—Yarrow to the feet.—Rue, with the buds of honeyſuckle, bramble, and elder, to the wriſts or feet.—To the wriſts or feet they alſo apply mouſe-ear with vinegar and ſalt, wallpepper, ſhepherd's purſe, ſun-dew, vervain, and other plants. Theſe are generally applied about an hour before the fit.

By the ſpirits, or wine drank at the approach of the fit, the patients generally become intoxicated, and they for the moſt part increaſe the quantity, until that effect is produced, which occaſions a very ſevere head-ache and aggravates the hot fit, but ſometimes puts a ſtop to the future returns

of

of the diſeaſe: a cure attended with great pain and danger. It is doubtful how far the other ingredients, mixed with the ſpirits or wine, may contribute to remove the diſeaſe, except ſuch as occaſion a violent vomiting; an emetic taken an hour before the fit frequently proving ſerviceable. Many of the other remedies taken before the fit operate by producing a ſweat. From the violent operation of the ignited glaſs or flint quenched in beer, and frequently of the crude brimſtone, ſome arſenical particles may be ſuſpected to be conveyed by them; and in that caſe, there will be no difficulty to account for their efficacy in curing inveterate agues.

The baſis of the quack medicines uſed for this diſeaſe is generally the bark, infuſed in wine or ſpirits, with an addition of ſnake-root and ſalt of wormwood. But perſons cannot be too cautious in uſing quack medicines for agues, as the poiſon of arſenic, in a ſmall quantity, is known to be very powerful in removing them: a remedy which incautiouſly uſed would prove worſe than the diſeaſe, and often be productive of the moſt alarming ſymptoms!

After

After all, it is certain, that the bark, when good in its kind, and judiciously given, is the most effectual remedy that can be administered, and has often completed a cure, when every other remedy had proved unsuccessful. There are, however, many cases of intermitting fevers, in which this remedy cannot with safety be given in any form. The attack of the fever is often so violent, that it leaves the constitution generally disordered; the patient is seldom or never free from the fever, and is constantly harrassed with a severe head-ache, pain of the back, and uneasy sensations of heat, pain, and oppression over the whole body. In short, there is often no complete intermission of the fever, in which the bark can be given; although the preservation of the patient's constitution and sometimes that of his life seems to depend on its administration. In this situation, when giving the treatment of the hot fit, the free use of blisters, antimony and opium was formerly recommended: on the use of the last it was reserved to this place more fully to enlarge.

It has long been a prevailing opinion, that the cold fit is attended with the greatest danger;

danger; and that moſt who die of intermitting fevers, expire during the rigors. I never ſaw a perſon die in the cold fit, but have known ſeveral carried off in the hot one, by ſtrong convulſions, a delirium, and other ſymptoms: and am clearly of opinion, that it is the hot fit, or fever, which moſt endangers the patient's life, and by its continuance, weakens and impairs his whole habit of body.

For this fever I have in opium been ſo fortunate as to diſcover a remedy, which generally in a few hours brings on a complete intermiſſion. This diſcovery was owing to the following incident.

In the month of December 1766, a lady, after ſome days indiſpoſition, was ſeized with a violent fit of an ague, which left her very weak, and univerſally diſordered. In thirty-ſix hours afterwards the fit returned. It had continued twelve hours, when I was called to viſit her. At this time her ſtrength and ſpirits were ſo exhauſted, that ſhe began to deſpair of recovery. She complained of ſevere pains over the whole body, but principally in the head and back: the head-ache was indeed ſo intolerable, as to threaten a delirium:

delirium: a conſtant reaching and vomiting at the ſame time reduced her to a ſtate of great languor, accompanied with a ſtrong tendency to convulſions. In this condition I immediately preſcribed an opiate, and in leſs than five minutes it reſtored her to a ſtate of perfect eaſe and tranquility. In leſs than half an hour ſhe ſat up in her bed, and could take nouriſhment. All that night ſhe ſlept little, though ſhe had no other complaint but weakneſs and fatigue. Next day ſhe took the bark, which effectually prevented the return of the fever; and ſhe quickly recovered her former ſtrength.

About a month afterwards ſhe had a relapſe. The intermiſſions of the fever were ſhort and indiſtinct. When I was called, ſhe had laboured under it forty-eight hours, and moſt of the former violent ſymptoms had appeared. As ſhe was very hot, had a ſtrong fever, and had no vomiting, I was at firſt unwilling to give an opiate, but, unable to reſiſt her ſolicitations, I at length conſented to it. The opiate was no ſooner given than it again brought on a perfect intermiſſion, and gave immediate relief from all her diſtreſſing ſymptoms. Next day ſhe had

had recourſe to the bark, which ſtopt the ague; and ſhe has continued ever ſince in perfect health; uſing, for ſome time afterwards, the precaution of taking the bark once or twice a day during moiſt weather, or an eaſterly wind, particularly at the full moon.

Such benefit being unexpectedly received from an opiate, I determined to make a further trial of its effects. Having at that time twenty-five patients, labouring under intermitting fevers, I preſcribed an opiate for each of them, to be taken immediately after the hot fit, provided the patient had then any inquietude, head-ache, or ſimilar ſymptom uſually ſubſequent to the fever. The conſequence was, that nineteen in twenty-two received immediate relief; the other three had no occaſion to take it.

Encouraged by this ſucceſs, I next day ordered the opiate to be given during the hot fit. In eleven patients out of twelve, to whom it was thus adminiſtered, it removed the head-ache, abated the fever, and produced a profuſe ſweat; which was ſoon followed by a perfect intermiſſion.

Since that time I have preſcribed an

opiate

opiate* to upwards of three hundred patients, labouring under this diſeaſe. I obſerved, that when given during the intermiſſion, it had not any effect, either in preventing or mitigating the ſucceeding fit: when given in the cold fit, it once or twice ſeemed to remove it; when given half an hour after the commencement of the hot fit, it generally gave immediate relief.

The effects of opium given in the hot fit of an intermitting fever, are,—1ſt, It ſhortens and abates the fit; and this with more certainty than an ounce of bark is found to remove the diſeaſe. 2dly, It generally gives a ſenſible relief to the head, takes off the burning heat of the fever, and occaſions a profuſe ſweat: This ſweat is attended with an agreeable ſoftneſs of the ſkin, inſtead of the diſagreeable burning ſenſation, which uſually affects patients ſweating in the hot fit, and is more copious than in thoſe who are not under the influence of opium.

* The following was the draught preſcribed.

Recipe, Aquæ fontanæ ſeſcunciam, aquæ alexiteriæ ſpirituoſæ, ſyrupi meconio, ſing. drachm. ij. tincturæ thebaicæ gutt. xv. ad xx. M.

3dly, It often produces a ſoft and refreſhing ſleep to patients before harraſſed with the fever, from which they awake bathed in ſweat, and in a great meaſure free from complaint.

I have always obſerved, that the effects of opium are more uniform and conſtant in intermitting fevers than in moſt other diſeaſes, and are then more quick and ſenſible than thoſe of moſt other medicines. An opiate thus given, ſoon after the commencement of the hot fit, by abating the violence and leſſening the duration of the fever, preſerves the conſtitution in a great meaſure uninjured; ſince I have uſed opium in agues, a dropſy or jaundice has ſeldom attacked any of my patients, in theſe diſeaſes.

In caſes where opium did not immediately abate the ſymptoms of the fever, it never augmented their violence. On the contrary, moſt patients reaped ſome benefit from an opiate given in the hot fit; and many of them bore a larger doſe of opium at that time than at any other. Even a delirium in the hot fit is not increaſed by opium; though opium will not remove it. If the patient be delirious in the fit, the adminiſtration of the

opiate

opiate ought to be delayed, until he recovers his ſenſes; an opiate will then be found to relieve the weakneſs and faintneſs which commonly ſucceed the delirium.

Opium ſeems alſo, in this diſeaſe, to be a good preparative for the bark, as it not only produces a complete intermiſſion, in which caſe alone that remedy can with ſafety be adminiſtered; but occaſions ſo ſalutary and profuſe an evacuation by ſweat, as frequently to render a leſs quantity of the bark requiſite.

The opiate was generally given in about two ounces of tinctura ſacra, when the patient was coſtive and was to take the bark immediately after the fit: thus at the ſame time ſhortening the fit, and cleanſing the inteſtines, previous to the adminiſtration of the bark. The operation of the tinctura ſacra is not prevented, though ſomewhat retarded by the opiate. When a vomit is given juſt before the fit, the adminiſtration of the opiate after it ſhould be poſtponed until the hot fit is begun.

Theſe obſervations are the reſult of an extenſive practice; during the late epidemical rage of intermitting fevers in the years

 1765,

1765, 6, and 7, I ſeldom viſited leſs than thirty or forty patients every day, labouring under every ſpecies of this diſeaſe. I have confined myſelf chiefly to practical obſervations: the different ſpecies of intermitting fevers have already been amply deſcribed, both by the ancient and modern phyſicians; thoſe diſeaſes having been as obſtinate in Greece and Rome, in the days of Hippocrates and Galen, as they are at this preſent time *.

Although nothing has been added to the accurate deſcription of theſe fevers given by thoſe old authors, yet the induſtry of later ages, by the diſcovery of new medicines, and by the more extenſive application of thoſe before known, has rendered theſe diſeaſes no longer the opprobrium of phyſic.

* Les fievres intermittentes, qu'on appelle vulgairement fievres d'accès, exercent leur empire dans preſque tous les golfes du Levant; tellement que j'ai vu dans ceux du Volo, de Zeitoun, de Lepante, de Corinthe, d'Alexandrette, et pluſieurs autres, des vaiſſeaux preſque déſarmés par les ravages qu'elles avoient faites ſur les équipages.

Eſſai ſur les Maladies des Gens de Mer, par G. M. Maître des Arts et en Chirurgie, publié à Marſeille, an. 1766.

An

An easy way to render Sea Water fresh, and to prevent a scarcity of provisions at Sea.

Sea water freshened by distillation: general history of the discovery: objections obviated. Contrivances for distilling it. Large quantity yielded by a ship's coppers; the requisite time and fuel. Examples of distillation at sea, with a still, inverted tea-kettle, hand-pump. When fresh water scarce, provisions to be dressed in the steam of sea water. Enquiry into substances of most nutriment. Salep and portable soup contain most under the smallest bulk; are cheap; easily prepared as food, without fire, with sea-water; keep long. Recommended at sea. Short allowance-money to be paid in the merchant service as in the navy.

IT may not be foreign to the subject of this treatise, to subjoin a few directions for defending those who go abroad, against the calamities of hunger and thirst.

The means of obtaining fresh water at sea has hitherto been justly esteemed a requisite towards perfecting the art of navigation. The want of this necessary article in the midst of a wide ocean, whose extent leaves no prospect of relief, has always been considered one of the most dismal situations in which seamen can be placed. Such we mean to refer to the surrounding element for relief.

In the year 1761, I was so fortunate as to discover, that the steam arising from boiling sea water was perfectly fresh, and that sea water, simply distilled, without the addition of any ingredient, afforded a water as pure and wholesome as that obtained from the best springs. I found, after a series of experiments, that the steam arising from sea water, while boiling, did not contain any perceptible salt or bitumen; that it was sufficient to cool this steam in order to have good water; and that the slight burnt taste, which it acquired from the vessels, quickly went off on exposing it to the air. In short, I found, that ships at sea, when in want of fresh water, might always be effectually relieved, by boiling sea water, and collecting the

the steam arising from it. I recommended their carrying always a still to sea for this purpose; but when they were not provided with a still, found it might be done, in smaller quantity, by boiling the sea water in the same vessels they usually did their provisions, fixing a metal pipe into the cover of the vessel to receive the steam, and afterwards making the pipe pass through a cask of cold sea water, to condense or again cool the steam into fresh water. This simple form of distillation would generally yield a sufficient supply of water to preserve the lives of all the men on board. Should a larger quantity be requisite for matters of convenience, it would require fitting a still-head to the vessel, and using a proper worm-tub or cooler.

The distillation may be carried on, when fuel is plenty, by having nothing but the sea water put into the pot: but, when fuel is scarce, to save that article as much as possible, it may be carried on by applying the still-head to the pot in which the provisions are boiling; the distilled water will be equally good, whether the water in which the provisions are boiled be fresh or salt,

only it will have received a ſlight flavour from the particular article boiled. This however will not be neceſſary in ſhips of war, as, from the conſtructions of the coppers, there are always two heated at the ſame time, ſo that the diſtilling veſſels may be applied to one copper, while the proviſions are boiling in the other. In either caſe the diſtillation is attended with very little trouble, and may be ſo conducted as to prove no interruption to the cooking of the victuals. Having given in the latter editions of my Eſſay on preſerving Seamen a full account of this diſcovery, and of the benefits reſulting from it, I will here only add ſuch circumſtances, as were there paſſed unnoticed.

The importance of this diſcovery no ſooner engaged the attention of the public, than it ſhared the fate of many other uſeful diſcoveries: it was claimed from the author by other perſons; was ſaid to have been formerly known; and met with various objections. Each of theſe we will ſeparately examine.

A claim to this diſcovery by Doctor Poiſſonniere appeared in a paragraph of news

news from Paris, dated July the 9th, 1764*.

But three years before, in 1761, I had publickly demonstrated, by various experiments, at the royal academy at Portsmouth, that a simple distillation rendered sea water perfectly fresh, pure, and wholesome. These experiments were made in the presence of Mr. Hughes, resident Commissioner of the navy at that port, and of Mr. Robertson, late Master of that academy. In the month of May 1762, an account of this discovery was read at a numerous meeting of the Royal Society in London; and in March 1763, the second edition of my Essay on preserving Seamen, containing this discovery, was published in London, by the authority of the Lords Commissioners of the Admiralty; which honour their Lordships were pleased to confer, on account of this important discovery.

Ten years after this discovery was made, in the year 1771, Mr. Irving made an alteration in the method of distilling the sea

* Doctor Poissonniere, I since find, has in his memoir confined his claim only to an improvement in the construction of a still for the use of ships at sea.

water,

water, by ſubſtituting, in order to condenſe the ſteam, a large open pipe kept conſtantly wet with mops, to the ſmall ſlender pipe paſſed through a tub of cold water commonly uſed in diſtilling. This, from being applied to larger coppers than the common method ever had been in the diſtillation of ſea water, yielded a larger quantity of freſh water than the former had done. For this ſuppoſed improvement, he received a reward from parliament, which has led ſome to believe him to have been the original diſcoverer of ſea water being rendered freſh merely by diſtillation. This opinion we need not here ſtop to refute, as, beſides the experiments and publication already mentioned, the firſt edition of this Appendix was preſented to the public ſeveral years before Mr. Irving began his experiments. The ſuppoſed merits of his alteration in the method of diſtilling the water I have already ſufficiently diſcuſſed, in the laſt * edition of my Eſſay on preſerving Seamen.

Secondly, It is ſaid, this ſimple method of rendering ſea water freſh was before

* The third edition, chap. I. ſect. XIV.

mentioned

mentioned by Lord Verulam, and practised by Sir Richard Hawkins.

The passage * of Lord Verulam referred to, is as follows: "It hath been ob-"served by the ancients, that salt water "boiled, or boiled and cooled again, is "more potable than of itself raw: and yet "the taste of salt in distillations by fire "riseth not; for the distilled water will "be fresh. The cause may be, that the "salt part of the water doth partly rise in-"to a scum on the top, and partly goeth "into a sediment in the bottom, and so is "rather a separation than evaporation, but "it is too gross to rise into a vapour, and so "is a bitter taste likewise; for simple distil-"led waters of wormwood, and the like, are "not bitter." This great philosoper knew, that neither a bitter taste, nor that of sea salt, rose in distillation with water; it being a common custom to preserve herbs for distillation with sea salt, which notwithstanding being put in the still with the salt, yet yield a water perfectly fresh. However, it was not the salt itself, nor the bitter taste,

* Bacon's Natural History, Cent. 9th, Exp. 881.

which

which was ſuppoſed to riſe in the diſtillation of ſea water, but a bituminous ſubſtance, and a ſpirit of ſea ſalt; which has hitherto been the unanimous and uncontroverted opinion of the chymiſts.

Sir Richard Hawkins is ſaid to have known that ſea water was rendered freſh ſimply by being diſtilled, from an ambiguous expreſſion in his voyage, that he "with "four billets diſtilled a hogſhead of water "wholeſome and nouriſhing." No mention is indeed made whether with, or without, the aſſiſtance of additional ingredients; but till I had publiſhed that no ingredient was neceſſary to render ſea water freſh, Sir Richard was always ſuppoſed to have uſed ſome ingredient *. His expreſſion even points out the ingredient uſed, *viz.* wood aſhes: four billets of wood were too ſmall

* See a letter from Captain Chapman to Doctor Fothergill, publiſhed in the London Magazine for Auguſt 1759, where the captain gives an account of his diſtilling freſh water from the ſea, firſt with the aſſiſtance of ſoap, then (led by this expreſſion of Sir R. Hawkins) of wood aſhes; and diſplays much ingenuity in contriving a ſtill from the materials on board of ſhip, having on his return from Ruſſia loſt moſt of his water in a hard gale of wind.

a quantity

a quantity to have been employed as fuel; agreeable to the prevailing idea, that it was necessary to add something to the water to keep down the bitumen, they must have been burnt to ashes, and then mixed with the sea water from which the hogshead of fresh water was distilled; so small a quantity of fuel would scarce warm a hogshead of water, far less raise it into vapour.

That it was not understood, either from Lord Verulam or Sir Richard Hawkins, that the waters of the sea could be rendered fresh merely by distillation, without adding some ingredient to keep down the supposed bitumen and spirit of salt, fully appears from the approbation since given to the following attempts.

A few years after his lordship's death, Sir Theophilus Oglethorpe and some gentlemen obtained a patent for distilling from the sea a water fresh and potable by means of several additional ingredients, and made several experiments upon it on board ships at Spithead.

In the year 1739, the learned Doctor Hales proposed a method of distilling fresh and

and wholeſome water from ſea water, by making it undergo a previous putrefaction.

In the year 1753, Mr. Appleby was thought to have brought this matter to the greateſt perfection, by diſcovering an effectual method of fixing the ſuppoſed bitumen and ſpirit of ſalt by means of Lapis Infernalis, and calcined bones. This was publiſhed in the London Gazette of January 22d, 1754, as follows: "Mr. Joſhua Ap-
" pleby of Durham, chemiſt, having diſ-
" covered an eaſy and expeditious method
" of rendering ſea water freſh and wholeſome
" at ſea; and the ſame, on a reference from
" the admiralty, having been thoroughly
" examined and approved by the college of
" phyſicians and the commiſſioners of the
" victualling, the lords commiſſioners for
" executing the office of lord high admi-
" ral of Great Britain and Ireland, have
" publiſhed the proceſs uſed by the ſaid Jo-
" ſhua Appleby in the London Gazette,
" that ſo uſeful a diſcovery may be univer-
" ſally known. It is as follows: Put 20
" gallons of ſea water into a ſtill, together
" with ſix ounces of lapis infernalis, and

" ſix

" six ounces of bones calcined to whiteness, and finely powdered. From this quantity 15 gallons of fresh and wholesome water may be extracted, in two hours and a half, at the expence of little more than a peck of coals.—This proportion of ingredients will answer very well in these northern seas; but in some parts of the Mediterranean or Indian seas, where the water is more salt and bituminous, the quantity must be increased to nine ounces of each.—The ship's boiler should not be used for this process, what remains being very noxious."

The attention of all Europe was at that time drawn towards this discovery, which was esteemed the most fortunate of the age: various substitutes were proposed, instead of the noxious ingredients used in Mr. Appleby's process. For this purpose, Doctor Butler recommended capital soap-leys, Doctor Alston lime-stone, and Doctor Hales powdered chalk.

I fortunately discovered that all those ingredients were unnecessary, and that a simple distillation rendered sea water perfectly fresh and wholesome, while engaged in making comparative trials of the different ingredients,

dients, which had been propofed for keeping down the fuppofed bitumen and fpirit of fea falt, in order to afcertain the beft. Finding my firft experiments unfatisfactory, I intended to purfue them farther; and began by diftilling both rain water and fea water alone, to be kept as ftandards, whereby to judge of the effects of the different ingredients upon them. I was then pleafed to find that both thefe diftilled waters, which I had been led to confider as extremes, were, as far as I could judge, in every refpect alike and equal in purity to each other. Further experiments fully confirmed this. The burnt or empyreumatic tafte of the diftilled fea water, which had been formerly afcribed to bituminous fubftance, and had given rife to different ingredients being added in the ftill, I found was contained in the fame degree by the diftilled rain water. I found that it depended merely on the action of the fire, and that it quickly went off on expofing the water to the open air. Having thus difcovered that the intervention of any ingredient was unneceffary for frefhening fea water, I immediately turned my attention to the moft eafy method of diftilling it, and recommended,

as the moſt ſimple means for that purpoſe, that all ſhips ſhould carry to ſea ſtill-heads fitted to their coppers or boilers. This I ſhewed would yield a ſupply of freſh water as often as the common fire was burning, even though the proviſions were boiling at the ſame time, and in caſes of ſcarcity would always prove an effectual relief.

Laſtly, this diſcovery met with various objections, the principal of which I ſhall here endeavour to obviate.

Objection 1. A ſtill is requiſite for the diſtillation; which would be inconvenient in a ſhip.

Anſwer. A principal advantage of this diſcovery conſiſts in there being no longer a neceſſity for carrying a ſtill to ſea, as the ſhip's coppers or pots for boiling the victuals, fitted with ſtill-head covers, will fully anſwer that purpoſe, and are generally fixed in as commodious a manner as any ſtills can be. They only require a worm-tub or cooler, to be occaſionally placed near them during the diſtillation, which at other times may be kept in the hold: this is a caſk of cold water, through which a metal pipe,

conveying the ſteam, is made to take ſeveral turns, in order to condenſe the ſteam into water. By recommending ſtill-head covers to the coppers, I do not mean that they ſhould obſerve the exact form of the common ſtills; ſuch preciſion might ſomewhat increaſe the quantity of water diſtilled; but in general it will be ſufficient to have a large pipe, or a head in the ſhape of a funnel, riſing from the top of the copper, which ſhould be of ſuch a height, as to prevent the ſea water in the copper from waſhing over it, by the motion of the ſhip. This large pipe or head receives the ſteam, and, by means of a ſmall pipe inſerted, conveys it to the cooler. The diſtilling of ſea water will not injure the coppers, as appears from their being daily cleaned by boiling of ſea water in them; whereas when chalk, lime, and that poiſonous ingredient lapis infernalis were uſed, a ſtill muſt have been neceſſary; as it would require great trouble to clean the coppers afterwards, ſo as to render them again fit for boiling the victuals: No better proof can be obtained of the coppers being conſtantly kept clean, and free from verdigreaſe, than the

the distilled water being always perfectly sweet and good.

Objection 2. A sufficient quantity of fuel for the distillation cannot conveniently be carried to sea.

Answer. I have already shewn here, and more fully in the Essay on preserving Seamen, that fresh water may in pretty considerable quantity be procured at sea, without any additional expence of fuel, by fitting still-heads to the ship's coppers, which would then yield fresh water as often as the provisions are boiling; or, if a larger quantity be requisite, by fixing iron pots, instead of bricks, at the sides of the fire-place, which being filled with sea water might be made constantly to continue the distillation, howsoever the fire was engaged. But it is not on this point I mean to insist: To supply all persons at sea with a quantity of water sufficient for every common use, was not the object of my attention; it was confined to relieve them under circumstances of particular distress, and effectually prevent, in future, persons dying of thirst at sea. The vessel used for boiling the victuals of the whole ship's company, fitted with a proper

ſtill-head, will ſerve to diſtil a quantity of water ſufficient fully to anſwer this purpoſe. They who imagine that a diſtreſs for want of water in a ſhip, will alſo be attended with a want of fuel, muſt be ignorant of the contents of a ſhip, which are almoſt wholly combuſtible. The ſtowage of the hold is with fire-wood. The carpenter's ſtores, the junk, or pieces of old cable, &c. would, at the end of the longeſt voyage, ſerve for ſeveral months as ſufficient fuel for diſtilling the quantity of water neceſſary to preſerve the lives of the whole ſhip's company. And we will preſently ſhew, that by laying in a very ſmall addition of fuel, to what is done for the common purpoſes of the ſhip, a quantity of freſh water may be obtained from the ſea by diſtillation, which, even in the moſt crowded ſhips, would equal the uſual allowance carried to ſea for each man.

Objection 3. Danger attends the diſtillation of water on board a ſhip.

Anſwer. No more danger attends the diſtillation of ſea water, than the boiling of it in a common pot or copper. The only inconvenience to which it is liable, is that of being

being apt to run over from too intense a heat, or from the motion of the ship; by which last it is much less affected in distillation, than when boiling in an uncovered copper.

I shall next endeavour to point out a few simple contrivances for distilling of sea water, for the benefit of those who may be in want of fresh water at sea, and may not have used the precaution of carrying out a still-head.

When sea water is boiled in a close covered pot or vessel, it may be observed, that the steam arising from it is converted into fresh water, on the inside of the cover of the pot. From a pot of thirteen inches diameter, by frequently removing the cover, and pouring off the water collected upon it, a quarter of a pint of fresh water may be procured in an hour. The cover of the pot should be, at least, five or six inches above the surface of the sea water, to prevent its boiling up to it.

Let us suppose a ship at sea to be in distress for want of water, having eight men on board, and that the pot for boiling their provisions can contain five gallons and a

half, being twelve inches in diameter; by the following ſimple contrivance, with only a tea-kettle, a muſket, and a caſk, one gallon of freſh water may be procured every three hours; which is a pint for each man.

File off the handle of the tea-kettle, and fix the head of the kettle, when inverted, into a hole made for that purpoſe in the cover of the pot; this will prove a complete ſtill-head. Take the barrel of the muſket out of the ſtock, and after unſkrewing the breeching pin, put the barrel through two holes bored for its reception in the caſk, with a proper deſcent for the diſtilled water to run off; then ſtop up the holes in the caſk, and fill the caſk with ſea water; which will be a refrigeratory or cooler to condenſe the ſteam. In order to carry on the diſtillation, theſe ſhould be joined, by inſerting the ſpout of the tea-kettle into the upper end of the muſket-barrel: all the joints and places from whence the ſteam could eſcape, ſhould be luted or ſtopped up; a paſte compoſed of equal parts of chalk and meal, moiſtened with ſalt water, will do this effectually, and may be eaſily obtained:

tained: the tea-kettle and the cover of the pot ſhould alſo be kept down by a weight, to prevent the ſteam from forcing them up.

If the caſk ſhould be too near the fire, the muſket-barrel in which the ſteam is condenſed may be prolonged by the addition of the barrel of another muſket, or by a wooden pipe. If the barrel of another muſket be uſed, whoſe bore is not large enough to receive the extremity of the former, one end of it ſhould be heated in the fire, and dilated with a marline-ſpike. If a wooden pipe be uſed, it ſhould not be bored with a hot iron; as I have found by experience that the burnt wood would impart a permanent diſagreeable taſte to the diſtilled water.

If we may ſuppoſe a ſhip at ſea to have no tea-kettle on board, then let the wooden hand-pump, with which the water or beer is pumped out of the caſks, be cut through obliquely, and joined, ſo as to form an acute angle. One end of this tube ſhould be fixed into the hole made in the cover of the pot, the other ſhould be faſtened to the muſket-

 barrel.

barrel. By this nearly the ſame quantity of water may be procured as by means of the tea-kettle.

It may juſtly be ſuppoſed that the coppers uſed for boiling the proviſions will, in every ſhip, contain more than the proportion of two quarts of water for every perſon on board; if theſe were furniſhed with proper ſtill-heads, they would be ſufficient to yield in diſtillation the proportion of three pints of freſh and wholeſome water for each man.

From the improvements made in diſtillation by the ingenious Doctor Hales, publiſhed in the year 1757, it appears, that three pints of water could be procured in five minutes, that is, fifty gallons in twelve hours, from a ſmall cylindrical ſtill of Mr. Durand's, by the addition of ſix pewter plates ſet edgeways in its head. This ſtill was only 15 inches in diameter, at the wideſt part, and held ſix or ſeven gallons. A ſtill 22 inches wide, containing 30 gallons, would yield in diſtillation 100 gallons in the ſpace of 12 hours; and a ſtill 32 inches in diameter, would give 200 gallons in the ſame

ſame time, attended only with the ſmall expence of a buſhel and a half of coals, or of a proportionable quantity of other fuel. Three chaldrons of coals are thus more than ſufficient to ſupply 400 men, which is the complement of a ſixty gun ſhip, for two months, with half a gallon of water per day for each man.

Theſe propoſals are not confined to ſpeculation; I have frequently tried the experiments on ſhore, and at ſea they have all been repeated with ſucceſs.

In the year 1768, on board the Dolphin ſhip of war, in her ſecond voyage round the world, on a paſſage from Batavia to the Cape of Good Hope, 56 gallons of ſea water were put into a ſtill, and 42 gallons of freſh water drawn off in the ſpace of five hours thirteen minutes, with the expence of nine pounds of wood, and of ſixty-nine pounds weight of coals; this was upwards of a quart of water for each man on board *.

* The particulars of this experiment are given in the third edition of my Eſſay on preſerving Seamen.

In

In the year 1769, the experiment of diſtilling with an inverted tea-kettle and muſket-barrel, was tried on board his majeſty's ſhip the Dorſetſhire, in her paſſage from Gibraltar to Mahon, having then Lord George Lenox's regiment on board. In leſs than two hours the carpenter's pitch-pot was cleaned out for the purpoſe, fitted with a cover, and the whole apparatus got ready. The only difficulty which occurred, was to inſert the ſpout of the tea-kettle into the muſket-barrel; but this was preſently ſurmounted by joining them with ſome of the carpenter's ſheet lead. Twenty-two quarts of ſea water were then put into the pot, from which 19 quarts of freſh water were drawn off, in four hours, with the expence of ten pounds of wood.

In the year 1773, the experiment of diſtilling with the hand-pump and muſket-barrel was tried on board the Slambol, a trading ſhip, in the Eaſt Indies; when, from a pot holding ſix gallons of ſea water, ten quarts of freſh water were diſtilled in the ſpace of three hours, *viz.* at the rate of eighty quarts a day, ſo as effectually to re-

lieve

lieve them from all apprehensions of distress from a want of fresh water*.

The

* Extract from Captain Clancey's journal, on a passage from Bombay to Bengal, in the Slambol, a Moorish ship, in the year 1773.

" Tuesday, November 16, 1773.
" Latitude 16° 44´.
" Long. 5° E. off point Palmiras.
" Thermometer 81°.

" To day sounded " the tanks and " found in them " 60 inches of " water, which, " at two inches per day, is thirty days water; but the " north-east monsoon and the south-west currents hav- " ing so long attended the ship and retarded the passage " without any visible sign of shifting, therefore put the " crew to three pints of water per day, resolving by pa- " tience, vigilance, and a good look-out, the only " means left to save our passage at this time of the year; " to endeavour to keep our ground till the winds and " currents change in our favour.——Likewise tried " the ingenious Doctor Lind's method of distilling " fresh water from salt; and in three hours made ten " quarts of fresh water, exceedingly clear and well- " tasted, by this rude substitute for the still and worm (alluding to a sketch of the apparatus given on the journal): " am therefore in hopes we shall have no occasion " to bear up for water, since this little contrivance can " furnish, with little trouble, 80 quarts of good drink- " ing water per day."

From the sketch of the apparatus and the references annexed, it appeared, that Captain Clancey made use of a pot, which held six gallons of sea water, placed upon a common

The distilled sea water is purer than spring, river, and even rain water. The taste, which it receives from the distilling vessel, is, in some measure, lessened by throwing away the first running from the still; and is wholly removed by keeping the water for some time, or exposing it to the air, when it will be found an excellent well-flavoured water, which will keep perfectly sweet for many years if put into clean vessels.

The benefit of this discovery is not confined to ships at sea. It is a subject which on many other occasions deserves the most

a common fire; the wooden pump was made to enter a hole cut in the cover of the pot, and transmitted the steam immediately to the gun-barrel, which passed through a cask of cold sea water, in order to condense the steam, and discharged the distilled water into a bucket placed at the lower end of it: Near the bottom of the condensing cask was a cock, to draw off the sea water, as often as it grew warm by the steam passing through it.

Captain Clancey had arrived in Ballasore road, but was forced from thence in a gale of wind. On his arrival in the River Hughly, Mr. Davis, surgeon of his majesty's ship the Dolphin, the gentleman who favoured me with this extract, observes, that he tasted the distilled water, which was the purest and best water he ever remembers to have tasted.

serious

serious attention, as will sufficiently appear from the following extract of a letter sent me from the Havannah; dated the 1st of September, 1762: "Before the surrender of "this place, our distress for want of water "became inexpressible: I would have given "with pleasure half a guinea for a pint of "such distilled sea water as I have fre- "quently drank at your table. Numbers "of our men died from a real want of "water, and many more from drinking "water which was unwholesome and poi- "sonous."—Would not a few stills sent from Jamaica have saved the lives of these men?

On similar principles to those of obtaining fresh water by collecting and condensing the steam of sea water, it becomes necessary to recommend, in cases of a scarcity of fresh water, the employing of that steam for cooking of the provisions without attempting to condense it; which will prove a great means of saving the fresh water. In the steam of boiling sea water most sorts of provisions, fresh or salted, beef, pork, fowls, rice, vegetables, &c. may be stewed or dressed, equally well as in fresh water. For this purpose

purpoſe they may be put into a net or a cullender, and placed in the mouth of the pot containing the boiling ſea water; as the Turks dreſs their favourite diſh, a Pillau; or they may be ſuſpended on hooks in the boiling pots, ſo as not to touch the ſea water, the ſteam being confined by a tight cover.

When a quantity of proviſions are to be dreſſed, the beſt method will be to convey the whole ſteam of the boiling water into another veſſel, by means of a pipe. In this laſt veſſel, the meat ſhould be ſuſpended in nets or on hooks, in ſuch a manner, that the brine, or drippings, if the meat be ſalted, may fall into the bottom of the veſſel, and the ſteam be equally received by the whole.

From what has been ſaid, it is evident, that no perſon upon, or near the ſea, can ſuffer death from want of water, who will have recourſe to the eaſy means here pointed out of obtaining it.

Having thus uſed our endeavours to prevent perſons at ſea from periſhing for want of water, our attention will next be directed towards ſecuring them from ſuffering by a want of proviſions.

On

On this subject our researches are imperfect, when compared with the extensive application of the discovery made respecting the former: ingenuity may there compensate for neglect, but the best means we have been able to trace for averting the dangers of the latter, are confined to precaution. The principal circumstances which limit the quantity of provisions carried by ships to sea are the room they take for stowage and the length of time they will keep good. To extend these limits has been my endeavour. With this view I instituted an inquiry to discover the most nutritive substance, which, from being small in bulk, easily prepared as food, and capable of long preservation, might be carried to sea in addition to the usual victualling of the ship; and, without taking much room for stowage or the risque of decay, might prove in times of scarcity an effectual resource against famine. The observations I am to offer contain the result of this enquiry.

The substances I have found most fit for the purpose are powder of salep and portable soop; which convey the greatest quantity of vegetable and animal nourishment under the

the ſmalleſt bulk. An ounce of powdered ſalep, and another of portable ſoop, diſſolved in two quarts of boiling water, become a rich thick jelly, capable of receiving any flavour from the addition of ſpices. This is ſufficient ſuſtenance for one man a day; two pounds of each would ſerve him a month; and being a mixture of both animal and vegetable food, it is more wholeſome than either uſed alone. There are daily inſtances of perſons being ſupported for many months by a much leſs nouriſhing diet, boiled rice, and even by gum arabic alone. Haſſelquiſt, in his voyage to the Levant, informs us, that a caravan from Ethiopia to Egypt, having expended all their proviſions, lived for two months on gum arabic diſſolved in water; this gum having luckily been part of their merchandiſe. The gum ſenega or arabic ſerves as a ſuſtenance for whole negro towns, during a ſcarcity of other proviſions occaſioned by a failure of their crops of millet and rice; and the Arabs, who twice a year collect this gum in the inland foreſts on the north ſide of the river Niger, have no other proviſions to live upon for ſome months.

The

The jelly of salep and portable soop is far more wholesome and nourishing than double the quantity, or a gallon, of rice-cake made by boiling rice in water, on which sailors are often obliged solely to subsist for several months, especially in voyages to Guinea, after the bread and flour are exhausted, and the beef and pork have become unfit for use.

The expence of the two articles recommended is trifling. The powder of salep is generally sold for four shillings and six-pence a pound: and a pound of portable soop, which conveys, if properly made, the nourishment of twelve pounds of beef, is sold for half a crown.

The superiority of salep to other vegetable substances is not confined to its conveying more nourishment, it can also be on emergencies used as food without boiling: on this account it may often be used in situations where other substances cannot be dressed. In preparing some of them, as rice, the consumption of fuel and the waste of water, in the long boiling, becomes also a considerable object.

Salep will form a paste with cold water;

ten times its weight of water forms it into a paſte or cake; if mixed with more, a ſeparation of the redundant water will enſue. This paſte, with the addition of a little vinegar, will ſerve to allay both hunger and thirſt, and will keep good for ſeveral days.

Salep is not too ſalt when mixed with ſea water; in this caſe it ſhould not be allowed above ſix times its weight of water; which quantity is juſt ſufficient to render it palatable, being of itſelf a very inſipid powder.

The addition of ſpices to the portable ſoop and ſalep, will not only render them more grateful to the palate, but alſo tend to improve their nutritive qualities; as would appear from the following late incident of famine on board a ſhip at ſea.

In the year 1762, while the Engliſh troops were at Manila, a Malaye ſhip arrived there from Macaſſar, which, by the ſhifting of the monſoon, had been detained at ſea much longer than was expected; the men had been reduced to ſuch extremities for want of proviſions, as to be obliged to ſubſiſt for two months, almoſt wholly upon water and ſpices; the latter, *viz.* cinnamon, mace, and pepper, being the cargo of the ſhip;

ſhip; notwithſtanding which, upon their arrival at Manila, they all, to the number of thirty, were in perfect health.

Salep and portable ſoop, when kept dry, will remain good for many years.

From what has been ſaid, we may juſtly draw the following inferences:

As two pounds of ſalep, with an equal quantity of portable ſoop, will afford a wholeſome diet to one perſon for a month, would it not be expedient for every ſhip to carry to ſea a quantity of theſe articles, in proportion to the number of the men, leſt from unavoidable accidents the other proviſions might be exhauſted during the voyage, or through fire, ſhipwreck, or other accidents, the crew be obliged to have recourſe to their boats? Suppoſing a boat furniſhed with eleven gallons of water, two pounds of ſalep, and two pounds of portable beef-ſoop for each perſon, none in it will die of hunger or thirſt for at leaſt a month; during which time, the daily allowance of each perſon will be more than a quart of water, eleven ounces of a ſtrong ſalep paſte, and an ounce of portable ſoop. The ſoop ſhould be allowed to melt in the mouth; and in

that ſmall quantity, if properly made, are contained the nouriſhing juices of above three quarters of a pound of beef. In caſes of great extremity, the ſalep may be mixed with the ſea water, and will ſtill be equally wholeſome*. Would it not be adviſeable for ſhips in long voyages to carry a quantity of each of theſe articles, to be iſſued occaſionally, that their other proviſions might not be ſo quickly conſumed? Would not ſalep and portable ſoop alſo prove ſerviceable in beſieged towns, and in the long marches of armies; every ſoldier, by having a pound of each article given him, could carry more than a fortnight's ſubſiſtence for himſelf, without any inconvenience, to be uſed in caſe a ſupply of other proviſions ſhould be cut off?

I may add, as a ſcarcity of proviſions at

* One neceſſary precaution, which ought never to be omitted in a ſhip at ſea, is always to have a caſk of water either in the boat, or in ſome convenient place upon the deck, from whence it may be eaſily conveyed into the boat, as in caſes of fire and many other diſaſters at ſea, when the crew betake themſelves to the boats, it is often impoſſible to go down into the hold for water. The ſame precaution is equally neceſſary with reſpect to the ſalep and portable ſoop.

ſea

ſea may ſometimes proceed from the avarice of the maſters of merchant ſhips, who, from a lucrative view, have taken on board too ſmall a quantity of proviſions; if the maſters were obliged by the articles of agreement with the men, to pay a ſtipulated allowance of money for any deficiency that might happen in their proviſions during the voyage, as is done in the royal navy, would it not tend greatly to prevent the frequency of this diſtreſs?

I do not here offer to the public an alimentary powder, to ſuperſede the neceſſity of ſupplying our fleets and armies with other food; nor will the diſcovery of freſhening ſea water render the common precaution of carrying a ſtock of water to ſea leſs neceſſary: the intention of both theſe propoſals is only to ſupport life in particular ſituations of diſtreſs, and prevent an untimely death from hunger and thirſt.

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